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Medical Essays

AND

OBSERVATIONS.

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VOL. V.

PART II.

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Medical Essays

AND

OBSERVATIONS.

PART II.

ARTICLE XLIII.

An extraordinary Abstinence, *first thirty four Days, and soon after fifty four Days, accompanied with some remarkable Symptoms; by* JAMES ECCLES M.D.

A Beautiful and handsome young Woman about sixteen Years of Age, had her *Menses* regularly after she past fifteen, till *February* 1720, when, upon occasion of the unexpected

Death of a moſt indulgent Father, at the uſual time of their Return, ſhe had an immoderate Flooding, accompanied with fainting and trembling Fits, which ſeem'd to be hyſteric, and went off in a ſhort time, ſhe continuing pretty well till near the time her *Menſes* ſhould have returned, when ſhe had only an Appearance of them, and theſe Fits recurred, but abated ſoon after. At the time of her next monthly Period, ſhe had not the leaſt Appearance of it, and the Fits then returned more frequent, violent, and evidently convulſive.

About the Beginning of *May* ſhe was blooded and vomited. In few Days a ſecond Vomit was given; and ſoon after it was over, ſhe was ſeized with a Difficulty in ſwallowing, which, in a Day or two, increaſed to that Degree, that ſhe could ſwallow nothing, but upon every Attempt ſhe fell preſently into a Fit, attended with prodigious Tremblings, and reciprocal Diſtenſions of the *Thorax* and *Abdomen*, which were performed in a ſecond, and would continue to be repeated ſometimes a Quarter, ſometimes half an Hour, and always ended in a *Tetanus* or abſolute Rigidity of her whole Body; ſo that it was impoſſible to ply any of her Joints. She continued without eating or drinking from the middle of

May

May to the 15th of *June*, when ſhe was brought to Town, and her Phyſician, Dr. *William Eccles* had the above Relation from her Mother and Siſters, who had waited upon her all that time, but was himſelf witneſs of what follows.

When he was called to viſit her he cauſed a Spoonful of an *antihyſteric Julep* to be given, but as ſoon as it reached that Part of the *Oeſophagus* affected with the Spaſm, which was about two Inches below the *Pharynx*, the *Tetanus* immediately ſeized her. Finding that no Remedies could be given by the Mouth, he cauſed Fomentations and Poultices of *antiſpaſmodic* and *nervous* Medicines to be applied to the Neck, but without Succeſs; which made him order an Inſtrument to be made of Whalebone, with a Bit of Spunge fixed to one End of it, which was thruſt down to her Stomach, and met with conſiderable Reſiſtance at the contracted Part, both in thruſting it down, and pulling it back. However, after the ſecond Trial, the Spaſm yielded, and ſhe could ſwallow Liquids or Solids without Trouble.

She continued ſwallowing eaſily whatever was offered about three Weeks, but vomited every thing except the *antihyſteric* Mixture, Cherries or Strawberries; and very

oft threw up ſome green Stuff, mixed with what ſhe had taken laſt.

She had been coſtive all the Time of this Abſtinence, and continued ſo after it was over, for which it was found neceſſary to give laxative Clyſters; after one of theſe ſhe had a very conſiderable Evacuation of Blood by the *Anus*, to the amount of two Pounds in two Days, which was reſtrained by the Uſe of ſome vulnerary and aſtringent Clyſters; but in a ſhort time after ſhe perceived the Spaſm of the *Oeſophagus* returning, which ſoon increaſed to that Pitch, that by the middle of *July* ſhe could ſwallow nothing, and continued fifty four Days without eating or drinking, but often affected with the *Tetanus* more violent than formerly, and always inſenſible while the Fit continued. When there was an Attempt made to thruſt down the above-mentioned Inſtrument, the *Tetanus* returned with ſuch Violence, that it was thought ſhe was to die immediately.

After ſhe had faſted three or four Weeks, ſhe loſt firſt her Sight (her Eye-balls being drawn upwards by the convulſive Motion) and ſoon after her Hearing, but knew her Friends who attended her by the Touch; ſo that when any of them took her by the Hand, ſhe would call them by their Names; and

and when ſhe had continued in that Condition about a Month, firſt her Sight, and ſome Days after her Hearing returned in their uſual Perfection.

About the 10th of *September* ſhe called for ſome Ale, which ſhe freely ſwallowed, and continued to take it, and ſometimes Whey; ſhe could eat Apples or Pears, raw or boiled, but no Bread, or any other ſolid Food. When ſhe had drunk Ale or Whey, ſhe fell into a Fit of Raving, which laſted an Hour or two; and when that was over, ſhe had the Uſe of her Reaſon perfectly well. The leaſt Diſappointment or Delay in doing any thing about her, brought always a Fit of the *Tetanus*.

In this Way ſhe continued till the 22d of *November*: From that till the Month of *March* 1721, there was little Alteration, only ſhe was much confined to her Bed, being taken up only once in eight or ten Days to have it made; and no ſooner was ſhe taken up, than ſhe had an Attack of the *Tetanus* which did not leave her till ſhe was laid down again.

Soon after this ſhe began to have hard Swellings behind her Ears, which remained there the 11th of *September* 1721, when the Doctor's Journal ends, at which time ſhe could ſit up in a Chair ſome Hours, and could

eat any kind of Garden-ſtuff, but could not taſte Fleſh or Broth.

All the time of her firſt and ſecond faſting, ſhe declared ſhe had no Senſe of Hunger or Thirſt, and when they were over, ſhe had not loſt much of her Fleſh.

It muſt be acknowledged, that during the firſt Courſe of it, ſhe had nouriſhing Injections of Broth, Zerry, and the Yolk of an Egg once, ſeldom twice in twenty four Hours, and the ſame during the firſt thirty Days of the ſecond Courſe, after which ſhe got none, the ſlighteſt Motion bringing a violent Fit of the *Tetanus*.

In both theſe Courſes of Abſtinence, her Pulſe was full, ſtrong and equal, but ſomewhat ſlower than it naturally ſhould have been; her Breathing free and eaſy, her Urine like a healthy Perſon.

In the laſt Abſtinence, as well as in the firſt, ſhe was coſtive, ſo as to have no Paſſage a whole Month, which made it neceſſary to give her laxative Clyſters.

All that I could learn about her from the time that the Doctor's Journal ends is, That ſhe continued much in the ſame way, ſubject to Returns of the convulſive Motions and *Tetanus*, and perfectly eaſy in the Intervals, no way ſenſible that ſhe had been in any ſuch Fit, tho' ſhe could always perceive when

when it was coming on. She continued to eat any Garden-ſtuff, but loſt her Fleſh. When talking to her Friends, very eaſily ſhe unexpectedly died, in the End of *December* 1721, without having made any Complaint, and without any convulſive Motion or Struggle.

A Promiſe ſhe had taken of her Mother, not to allow her Body to be opened, prevented any further Examination than looking into the Part of the Gullet, which had been convulſed, where nothing extraordinary could be obſerved.

XLIV. *An extraordinary Abſtinence during fifty Years; by the Reverend Mr.* THOMAS STEILL *Miniſter at* Avandale.

BEing willing to gratify your Deſire, I hereby ſend you an Account of *Janet Young*, who lives in this Pariſh. Having heard ſomething extraordinary of this Woman, I went upon the 29th of *Auguſt* 1729, and converſed with her, ſhe being then ſixty four Years of Age: She informed me that ſhe fell from her Horſe into the Water of *Aven*, in the 18th Year of her Age, in the

Month of *December*, having her *Menſtrua* upon her, which being the firſt, never recurred; but that ever ſince, 'till about four Years ago, ſhe had a frequent vomiting of Blood, and even, in the Intervals, a continual Reaching or Propenſity to vomit, throwing up nothing.—— She informed me, that ſince her Fall ſhe had taken little or no Meat, but lived, in the Summer, only on Whey, and in the Winter on Milk, or Milk and Water mixed, or pure Fountain-water, of which ſhe drinks pretty liberally, ſmoaking very much Tobacco; to which Practice ſhe was obliged to betake herſelf, whenever ſhe felt that Reaching, boaking or Propenſity to vomit, it being the only Mean ſhe found effectual to divert it. And at the ſame time ſhe told me, That ſince the middle of *May* laſt, ſhe had neither taſted, Fleſh, Fiſh, Fowl, Meal, Broth, Herbs, Roots, nor any kind of Meat whatſoever. She voided little or no Excrements by Stool; and for the Space of ſixteen Years, ſhe voided none but once in the Year, which was always in the Month of *March*, much like a ſmall bit of Roll-tobacco, or one globulet of Sheep-dung. She ſweat ſome, and at that time ſleeped ordinary well.

I have made it my Buſineſs yearly ſince that time to go and converſe with her, and found

no

no Alteration till *Auguſt* laſt, when ſhe told me that her Sleep was much broke by theſe violent Retchings and Inclinations to vomit, while at the ſame time ſhe throws up nothing.

This, Sir, is the ſhort Account ſhe gives of herſelf, aſcertained by a Woman who lived in the Houſe with her 12 Years, and confirmed by all her Neighbours, the Certainty of which I have no Reaſon to doubt, the poor Woman having no Temptation nor Encouragement to humour a Fraud or Deceit of any ſuch kind, maintaining herſelf by her own Induſtry, neither expecting nor accepting any Benefit on that Account. I am,

Sir, your moſt humble Servant,

Strathaven,
July 10. 1734. THO. STEILL.

We Mr. *Thomas Steill* Miniſter of the Goſpel at *Avendale*, and *Andrew Cochran* Surgeon in *Strathaven*, and Baillie of *Avendale*, do hereby declare, that according to the beſt of our Knowledge, and the moſt certain Information we could have anent the Caſe of the forementioned *Janet Young*, what is above narrated is a juſt and true Account of her Condition; in witneſs whereof we

we have ſigned this Declaration Date and Place foreſaid,

THO. STEILL.
ANDREW COCHRAN.

By a ſecond Letter from Mr. Steill *we are informed, that ſoon after he had wrote what is above, the Woman took a Looſeneſs, and then eat a little thin Oat-meal Pottage every Day, her Retchings to vomit having left her; but lived a very ſhort time this way, having ſunk under her Diſeaſe and died.*

XLV. *Practical Remarks on the* Sympathy *of the Parts of the Body, by the late Dr.* JAMES CRAWFORD *Profeſſor of Medicine in the Univerſity of* Edinburgh.

AN exact and accurate Knowledge of the Structure and OEconomy of the ſeveral Parts of the human Body, and of the Influence each particular Part hath on another, is the principal Foundation both of Medicine and Surgery: For if one throughly know the proper and peculiar Function of each particular Part, and the Connection and

and Influence every one has on another, it will be eaſy to determine the Effects that will reſult in every Part, upon the Application of any known Cauſe to any determined Place; and, on the other hand, it will not be difficult, from the Effects that appear to our Senſes in any Place, to riſe into the Seat of the Cauſe that produced them, how far ſoever it may be from the Place of that Appearance. And thus a *rational Phyſician*, proceeding from Things that are viſible into thoſe that are hid, diſcovers where, and how he is to apply his Remedies, while an *Empirick*, who had nothing to guide him, runs many Hazards of doing ill rather than good, or of doing a thing rather wrong than right.

In outward Diſeaſes that appear to our Senſes, tho' we be not ſo liable to miſtake their Seat, or the proper Place to apply the Remedy; yet oftentimes the Effects appear in one Place, when the Source or real Cauſe lies in another; for diſtinct and remote Parts communicating or conſenting with one another by the Intervention of long Nerves and Muſcles, a Part really whole and ſound may be pained, and loſe its Motion, from the Influence of another in which no *Vitium* appears.

For penetrating therefore into the diſtant and latent Sources of ſuch Diſeaſes, we muſt be

be well acquainted with the Origin, the Courſe, Inſertion and Motion of every Muſcle, and with the Origin, Diſtribution and Communication of the Nerves that belong to every Part; and this ſort of Knowledge makes the great Difference betwixt a knowing Surgeon and an ignorant Mountebank or Barber; for the one, thinking every Diſeaſe has its Seat where the Effects appear, attempts to remove the Shadow while the Body remains, and loſeth the Time of Cure by a fruitleſs, and even hurtful Application of Medicines to a ſound Part; whereas the other, knowing the Fountain of the Malady, plies it in its proper Place, and plucking it up by the Roots, ſoon by the ſame Remedies ſets all to rights again.

I ſhall endeavour to confirm and illuſtrate what I have hinted at by ſome Caſes that may be a Foundation for others of the ſame kind, and ſerve to explain many ſtrange *Phænomena* in outward Diſeaſes little taken notice of by any Author; but, for the guiding us to the underſtanding of what I intend, I muſt premiſe,

1. That a Part is affected by *Protopathia*, when it is eſſentially in itſelf leſed, and owes not its Origin to any Communication from another Part.

Or by *Idiopathia*, when tho' it be eſſentially

tially leſed, yet the Hurt was at firſt propagated to it from ſome other Part.

Or *laſtly*, by *Sympathy* or Conſent, when the Part in itſelf is yet whole and ſound, and is only affected by the Fault of ſome other Part. It is of this laſt ſort only I deſign to ſpeak, tho' every leſed Action I am to propoſe, more frequently ariſes from *Idiopathia* or *Protopathia*.

2. Diſeaſes by Conſent are propagated from a Diſtance, (in which Caſe only I ſhall conſider them) either by long Muſcles or Nerves.

3. If the Conſent be by Nerves, it is produced by ſome Leſion at their Origin, at ſome *Ganglion*, or in ſome other Branch of the ſame Trunk that goes to ſome other Muſcle, or perhaps by ſome Hurt of the Nerve in a diſtant Part of the ſame Muſcle.

4. If the Conſent be by a *Vitium* of the Muſcle, it muſt be leſed either in its Origin, or in ſome diſtant Part of its Courſe; for wherever it be, the Effect will be moſt ſenſible and manifeſt about the Joint and Inſertion; the Tendon being the moſt ſenſible Part, the Pain is moſt felt there, and the Contraction or Relaxation appears beſt about the Joint.

5. In the *Conſent* both from Muſcles and Nerves, the *Vitium* is as well propagated back-

backward from the Inſertion or Extremity to the Head or Origin, as forward from the Origin to the Inſertion.

6. A Joint or Member may continue contracted, either by the *Flexors* being in a ſpaſmodick Contraction, or by the paralytick Diſpoſition or Debility of the *Extenſors* or Antagoniſts, without any Fault in the Flexors; in which Caſe the Member is eaſily and without Pain extended by another, if an *Anchyloſis* has not happened.

7. For determining whether the Fault ariſes from the Muſcle or from the Nerve, examine if there be a Wound, an Ulcer, a Contuſion or Tumor about either of their Origins or Courſes; if this way diſcover nothing, obſerve if this be the only Muſcle affected, and if ſo, you may generally conclude the Cauſe to be in the Muſcle, for ſuch a hidden Fault in a Muſcle is ſeldom propagated to another, except it have a large *Aponeuroſis*, or confound its Tendon with ſome other. But if the Nerve be affected, it communicates the ſame Effect to all the other Muſcles that have Branches from the ſame Nerve.

8. If by none of the foregoing Signs you diſcover the Origin and firſt Seat of the Diſeaſe, you may judge it *topical*, or *protopathick*, or *idiopathick* to the Part affected.

9. A

9. A Diſcovery of the Source of the Diſeaſe directs you to the Place where to apply your Medicines: In a *Protopathia* they muſt only be applied to the Part affected; in an Affection by *Conſent* only, to the Cauſe or Root of the Diſeaſe; and in an *Idiopathia*, both to the one Place and the other, and that according to the Degree or Danger of either. But the following Caſes being all made or ſuppoſed to be Affections by *Conſent*, the tracing them to their Origin ſufficiently directs to the Place of Application.

I. A Palſey or *cynick Contraction* of the Under-lip by *Conſent* has its Origin either in the Clavicle and Neck, the Origin and Courſe of the ſubcutaneous Muſcle called *Platyſma myoides*, or at the third *Vertebra* of the Neck where the Nerve of this Muſcle has its Origin, or laſtly, from the third Branch of the fifth Pair of Nerves, which, paſſing through a Hole of the Under-jaw at the Side of the Chin, gives a Branch to this Muſcle. When by the Signs formerly given you find the true Origin of the Diſeaſe, you are there to make your Applications.

II. If the Under-jaw cannot move downwards, it ariſes either from a Compreſſion, or Debility, or Palſey of the *Depreſſor* Muſcles of the lower Jaw in their Origin or Courſe,

Courſe, or from the Contraction of the *temporal* Muſcle or *Maſſeter*; or laſtly, from the Affection of the third Branch of the fifth Pair of Nerves that beſtows Branches on theſe Muſcles, or of the *Portio dura* that communicates three times with this Branch of the fifth Pair. The firſt Seat of the Diſeaſe found by its Signs directs to the Place of Application.

III. Upon a Stroke or Tumor on the Breaſt, there aroſe a Pain that was felt in the *Os pubis* and *Teſticles*, with an Inability to move the Arm inwards. The exterior oblique Muſcle of the Abdomen being hurt, or ſtretched in its Origin on the Breaſt, gave the greateſt Pain at the *Os pubis*, where its ſenſible Tendon is inſerted, and the Tendon being ſtretched by preſſing on the ſpermatick Veſſels and *Cremaſter* that paſs through it, cauſed the Pain of the Teſticles, and the pectoral Muſcle being alſo hurt, it could not move the Arm inwards: The Application muſt be here made to the firſt Cauſe. A ſtroke or Tumor on the fifth *Vertebra* of the Back, where the Nerve that moves the *pectoral* and exterior oblique Muſcle of the Abdomen has its Origin, may create theſe Symptoms in the ſame Places; but the *Deltoid*, *ſerratus minor anticus*, *Aniſcalptor* and *Obliquus inferior*, which receive Branches

ches from the ſame Nerve, would alſo be affected.

IV. A Tumor or Stroke on the *Os ſacrum* produces ſometimes an Inability to move the Arm down or backward, by hurting or compreſſing the *Aniſcalptor* that performs that Motion: The ſame may ariſe from the Affection of the Nerve that moves the ſame Muſcle; but then the *Pſoas*, *Complexus*, *Splenius*, &c. that receive Branches from the ſame Nerve, would be affected.

V. If, after a Stroke on the fifth *Vertebra* of the Back, the Neck could not bow but with great Pain, the *Rectus colli* that bows it riſing from this *Vertebra* being hurt. If it had ariſen from the Compreſſion or ſtretching of the Nerves, the *Pectoral*, *Serratus minor anticus*, *Aniſcalptor*, and the *Obliqui abdominis*, that have Branches from that Nerve, would alſo have been affected.

VI. If one cannot bow the Arm, it ariſes from the Head of the *Scapula* or from the *Humerus*, where the *Biceps* and *Brachiæus internus* have their Origin or Courſe; if it come from the Origin of the Nerves in the Neck, the Flexors of the Thumb and Fingers will be affected.

VII. If one cannot bow the Thigh, it ariſes from the Origin of the *Pſoas*, affected by ſome Tumor or Stroke on the firſt *Verte-*

bra of the Loins, or from a Compreſſion of the Origin of its Nerve in the ſame *Vertebra*; in this Caſe the Muſcles of the *Abdomen*, *Aniſcalptor* and *Sacrolumbalis*, would be affected. The *Iliacus internus* may hinder the ſame Motion. If it ariſe from its Nerve, the *Gluteus major* will be affected. If it move not inwards, the *Triceps* from the *Os pubis* or its Nerve which communicates with the *Gracilis*, *Iliacus* and two *Obturatores*, is affected. If it extend not the *Glutei*, or the Nerve which riſes from the firſt Pair of the *Os ſacrum*, and communicates with the *Iliac*, and Muſcles of the *Abdomen* are affected.

VIII. If one cannot croſs his Legs, the Fault may ly in the *Coſta* of the *Ilium* where the *Sartorius* has its Origin, or at the third *Vertebra* of the Loins, the Origin of its Nerve, and then the *Vaſtus externus* and *Crural*, having Branches from the ſame Nerve, will be affected. If the *Tibia* bow not, the Fault may ly in the *Iſchium*, where the *Biceps*, *Semimembranoſus* and *Seminervoſus*, have their Origin, or from the laſt *Vertebra* of the Loins and the *Os ſacrum*, which afford the Nerves to theſe Muſcles, the *Sartorius* and *Triceps* have Branches of the ſame Nerve with them.

Laſtly, If the *Tibia* extend not, the Cauſe may

may be in the *Costa* of the *Ilium*, where the *Rectus* and *Fascia lata* arise, or in the *Trochanter major*, *minor*, or the intermediate Space betwixt them, where the *vastus externus*, *internus* and *cruræus*, that extend the *Tibia*, have their Origin, or in the *Vertebræ* of the Loins and *Os sacrum*, and then the other Muscles of the Thigh and Leg, that have common Nerves with those, will be affected.

IX. If one cannot extend the Foot, or pull the Heel upwards the *Gastrocnemii* are affected in the Ham or in the Calf of the Leg, or the Nerves of these Muscles are affected in their Origin in the last *Vertebræ* of the Loins and *Os sacrum*. In this Case the Flexors of the *Tibia*, the *Triceps*, *Tibiæus posticus*, and the two Flexors of the Toes, that receive Branches from the same Nerve, are affected. If the Foot move not inwardly, the Fault lies in the Head of the *Tibiæus posticus*, or in the last *Vertebra* of the Loins and *Os sacrum*, which will be accompanied with the Debility of all the Muscles just now named, because of their Communication of Nerves. If the Foot cannot bow, it has its Origin at the Head of the *Tibiæus anticus*, in the external Head of the *Tibia*, or in the Top or Middle of the *Fibula*, where the *Peronæus anticus*

riſes, or in the laſt *Vertebra* of the Loins and *Os ſacrum*, where the *crural Nerve* has its Riſe. In this Caſe alſo all the Muſcles laſt named will be affected too.

I omit the other Affections of the Feet, as I did thoſe of the Hands, becauſe their Muſcles are not placed at any conſiderable Diſtance from their Inſertion, and that all their Nerves come from the *crural*, as the other did from the *brachial* Nerves.

I might with a little more Pains give many other Inſtances of the great *Sympathy* and Conſent that the Parts of our Body lying at a Diſtance have with one another, by the Intervention and Communication of Muſcles and Nerves, but theſe I think ſufficient to convince us how dangerous it is to truſt the Cure of the Diſorders of our Body to one that is ignorant of its Parts and Structure; and ſeeing we find no Body ſo fooliſh as to truſt one with the mending of his Watch that knows nothing of the Wheels and Springs whereby it goes, is it not ſtrange that ſo many can fearleſly venture their Joints and Members into ſuch Hands, where the Springs are as much more intricate as they are more valuable.

XLVI. *Hi-*

XLVI. *Hiſtories of ſucceſsful Indulgence of bad Habits in Patients, by* ALEXANDER MONRO, *P. A.*

THE old Axiom in Phyſic, That ſudden great Changes are dangerous, has been diſputed by ſome Moderns, who adviſe to give over immediately bad Habits. I have ſeen numerous Examples where it was neceſſary to have Regard to them, and even to indulge Patients in them if we expect to make a Cure. At preſent I ſhall mention only three:

1. A Cook in an Eating-houſe quarrelling with a Servant-maid, ſhe ſtruck him with a large Knife, and cut through a great Share of the right *Pinna* and *Septum* of the Noſtrils, ſo that it hang'd down towards his Lip. He had bled a long Time and was very faint by the Loſs of Blood, before his Noſe was ſtitched. His Wife was allowed to give him ſome white Wine among the Water-gruel he was ordered for Drink, or to make ſome Sack-whey for him; he however continued very low, and faint with Sickneſs at his Stomach, and Head-ach for three Days, till his Wife told me his ordinary Way of living was to drink a good deal of Ale, Wine and Brandy every Day, and

unleſs I would allow her to give him more and ſtronger Liquor, ſhe did not expect he would recover. I did not forbid her, which ſhe interpreted an Allowance, and gave a Gill or four Ounces of Brandy with ſome of our ordinary Ale; he was much better next Day, and with this Doſe every Day recovered daily till he was quite well.

2. A Man having broke the Bones of his Leg, after the Fracture was reduced, I ordered him to have no Drink given him except Water and Milk, Water-gruel, or ſuch like. He did not ſleep well in the Night; next Morning I found his Pulſe very quick, but low, and with Complaints of Pain in his Head, Thirſt, *&c.* Imagining ſome drunken Companions I ſaw come to viſit had given him ſtrong Liquors, I ordered him to be more ſtrictly watched by ſuch who I was ſure would obey me, and he was kept to the low Diet rigorouſly. He did not however ſeem relieved at Night, ſlept none all Night, and next Morning he was altogether delirious, got out of Bed, kick'd away the Box in which his Leg had been put, his Tendons were ſtarting, and he ſcarce knew any Perſon, his Pulſe at the ſame time intermitting, and being very low. One then preſent, whom I knew to be a very complete Drunkard of the low Claſs, aſſured me I would

would kill him if I did not allow him Ale and Brandy, for that the Patient had for ſeveral Years outdone him in irregular living. I conſented to allow a little; that Night he was much better, and next Morning was altogether free of Fever, Delirium, *&c.* when they acknowledged he had got a *Scots* Quart of Ale and a Gill of Brandy in the preceeding Day, which had made him ſleep well and ſound. This daily Allowance of Ale and Brandy then he had all the Time of his Cure, which went afterwards on without the leaſt Accident.

Hiſt. 3. A Diſtiller of Spirit of Wine at the *Weſtport*, ſitting upon the Edge of a Tub, into which the boiling Remains of a Stillful of Wine had been put, ſlid back into it, by which his Hips, Thighs, *Scrotum*, *Penis* and Belly were miſerably burnt, the Skin of theſe whole Parts turning quickly black and hard. I endeavoured to promote a Suppuration by Scarification, ſuppurating Ointments and Pultices, and, as his Pulſe was quick, ordered him to be blooded and kept on a low Diet; next Day he was much diſpirited with great Anxiety, and a low quick Pulſe; the third Day he was near as bad as what I mentioned the former Patient to have been, when his Wife inſiſted to be allowed to give him of the Spirits

he distilled, which he got, and soon became better, the Suppuration coming on the Teguments, which cured very well, his Wife, near the End of the Cure, acknowledging she had given a Mutchkin, or Pound of Spirits every Day.

XLVII. *Unexpected Cures by* Alexander Monro, *P. A.*

If Practisers in Physick and Surgery have sometimes uneasy Minds on account of Patients, the Nature of whose Diseases they cannot judge with Certainty, if they are disappointed now and then in the Effects of Medicines, and if they have the galling Mortification of the Sick dying unexpectedly, they have on the contrary frequently the Comfort and Pleasure of being surprised with the great Relief which their Patients, in very obscure, or even in Diseases which they are ignorant of, receive from Medicines, which either a very distant Analogy to some known Disease, or the Necessity of mitigating some urgent Symptom have made them prescribe; nay the Event sometimes is prosperous when the Medicines are differently applied, or have other Effects than the Prescriber

ſcriber intended. Though People ſhould be very cautious in laying down any general Rule in Practice, and ought not to found it on one or two Obſervations, yet I muſt think ſuch *unexpected Cures* as I have hinted at, deſerve to ſtand on Record, that if the Medicines employed are not of a very offenſive Nature, they may again be tried in ſimilar Caſes; ſo that ſick People may have ſome more Chance for their Recovery than the common Methods give. As a Specimen of ſuch Caſes, I ſend you the following Medley of practical Obſervations; if they are thought uſeful, I can furniſh you ſeveral more, and dare ſay, every one of the Gentlemen of your Society can add to the Number.

I. A middle-aged healthy Man having bruiſed the Extremity of the *Penis*, the Part of the *Prepuce* where the *Frænum* of the *Glans* is, was raiſed into a large *cryſtaline Tumor*. Topical aromatick Fomentations and *Suffumigia* being applied to it, and Catharticks being given, without its yielding, a ſmall Seton was put through it, with the View of allowing ſome of the watery Liquor to ouze out, and of bringing on a gentle Suppuration. Inſtead of this it occaſioned ſharp Pain, and a violent Inflammation, which made it neceſſary to take out the Cord, and to ap-

ly

ly an emollient Poultice of Milk and Bread. Next Day after this the Tumor was greatly diminiſhed, and the ſecond Day it diſappeared without a Return.

II. A young Man had a great many pale-red Excreſcences, of a very unequal Surface, with ſmall Necks on the interior Side of the *Prepuce*, and when the *Prepuce* was turned back, *Coxcomb* Excreſcences were likewiſe ſeen on as much of the *Glans* as he could uncover. The Account which he gave of his Diſeaſe to Dr. *James Dundas* and me, was, That having a ſmall Wart on the Edge of the *Prepuce*, he cut it away with a Razor, ſoon after which theſe Excreſcences began to appear. *Mercurial Ointments*, *Aſtringents*, *Eſcharoticks*, and ſeveral other Medicines had been tried in vain, and he had undergone ſix Weeks Salivation without any Benefit, though he averred ſolemnly that he was ſure they were not owing to any venereal Cauſe.

I tied a Silk Thread very tight round the Neck of one of them; he complained of ſharp Pain while the Nooſe was drawing, which ſoon ceaſed, and in two Days the Tumor dropt off, leaving the Surface of the Part it roſe from ſmooth and ſound.—— I deſired a young Surgeon, who had ſeen me make this Ligature, to take the other Excreſcences

creſcences away in the ſame Way. When this young Gentleman attempted next Day to put a Ligature on one of theſe Excreſcencies, he was timorous, and the Patient was not obſequious; ſo that the Ligature was not made tight enough to mortify the Tumor. The Patient felt very ſharp Pain all that Day, and by next Morning a very conſiderable Inflammation was raiſed, for which he was blooded plentifully, and emollient Fomentations and Pultices were applied to the Part. After two Days the Inflammation abated, and the Excreſcences were all conſiderably diminiſhed; and as the Inflammation went off, they ſhrivelled; ſo that after eight Days, during which the Emollients were continued, it could not be known where the Excreſcences had been.

Whether was it the Inflammation or the emollient Applications which made the Cure in theſe two Caſes? In my Opinion it was the Inflammation; and I am confirmed in it by the Succeſs which I have ſeen of ſtimulating Medicines in ſlow cold Swellings.

III. A Man who had been ſubject to the Gout, was by Accident burnt ſuperficially in the Face and Hands. After the Burnings were all skinned, a ſpongy Excreſcence, the Baſe of which was equal to a Sixpence, roſe out from the Point of his Noſe, and ſuch another,

nother, as broad as a Shilling at its Baſe roſe out from the right Cheek; they were both of a pale red Colour, and of a granulated Surface, throwing out from imperceptible Pores, a thin Liquor, which fell down in Drops ſo faſt, that a conſiderable Quantity of it could have been collected in a ſhort Time. After different Plaiſters, Ointments, Aſtringents, *&c.* had been tried to no Purpoſe, I covered the Excreſcences with the fine Cotton of old Linnen ſcraped with a Knife, and wet with *Alcohol.* I deſired the Cotton might not be taken off, but that it ſhould be wet three or four Times a Day with the Spirit. After this Application, the ouzing of Liquor decreaſed, and in two Days ceaſed altogether. The Cotton adhering to the Excreſcencies, they ſhriveled, and at laſt became ſmooth and plain with the other Parts of the Skin, leaving only a little Redneſs for ſome time.

IV. A young Man of a weak Conſtitution and thin Habit, having fallen from a Height, was bruiſed in a great many Parts of his Body, and particularly in the *hypogaſtrick Region.* He complained ſoon after of a ſharp Pain in the *Penis* and Region of the Bladder. Thoſe he adviſed with ſuſpecting theſe Pains might be cauſed by ſome Remains of a virulent *Gonorrhœa* which he had

had two Years before, injected ſome acrid Medicines into the *Urethra*, which increaſed the Pain, and occaſioned a conſiderable Inflammation in the *Penis*. When the Inflammation was removed, he had great Difficulty in making Water, with ſharp Pain along the whole *Urethra* when it did paſs. He then took ſeveral Doſes of *Sweet Mercury*, drank the Decoction of the Woods, and continued ſome time the uſe of gummous Pills, with ſome Grains of Mercury in them. The Symptoms becoming however worſe, I was conſulted about him four Months after his Fall.

He complained of a torturing Pain at the Root of the *Penis* and in the *Glans* when he attempted to make Urine, which let fall a white furfuracious thick Sediment in great Quantity when it cooled. I adviſed mild mucaginous Medicines, and an emollient healing Injection, with Fomentations to the pained Part. Theſe made him a little eaſier, but did not remove his Diſeaſe; and he was ſeized with feveriſh Paroxyſms, which had the full Type of Ague, but without regular Returns. Theſe waſted his Strength and Fleſh ſo faſt, that there was a Neceſſity to ſtop them, with a View to which, and to his original Diſeaſe the following Electuary was ordered, ℞ *Pulv. patrum, Drach.* ii.

Gum

Gum. Arabic. Drach. i. *ſem. Sal. Nitr. Drach.* i. *Pulv. milleped. unc. ſem. Sal. Jov. Londin, ſcrup.* i. *Syrup. diacod. q. ſ.* of this he took the Bulk of a Nutmeg twice a Day. The aguiſh Paroxyſms went off gradually, and the other Symptoms became milder till he was free of all his Complaints in ſome Weeks, and he has continued free of them ever ſince.

V. *Alexander Strachan* Gardner to Mr. *Erskine* of *Grange* had a Colick, which continued a Day in the Beginning of *February* 1734, after which a painful Tumor was obſerved towards the left Side of the epigaſtrick Region, which ſoon increaſed, and extended itſelf over that whole Region. He took ſome purgative Medicine after which he had a conſtant *Diarrhæa.*

When he was received into the Infirmary 6th *March* 1734, a Suppuration ſeemed to be ſo far advanced in the Tumor, that the Surgeons felt a Fluctuation of Liquor lodged deep, and the left Part of the Tumor pointed outwards; he complained of a ſharp Pain in the left Shoulder, and the Skin of his Face had that leadiſh Colour which is almoſt peculiar to People whoſe Livers are ſuppurated. His Pulſe was quick and low; he had no Deſire for Food, and, upon taking it, the Pain of the *Epigaſtrium* was much increaſed;

creaſed; he had perpetual Thirſt, ſleeped ill in the Night, and ſweated much in the Morning, with a *Diarrhæa* ſtill upon him.

To promote the Suppuration, a Pultice of Oat-meal boiled in Water, with ſome *Baſilicon*, and bruiſed raw Onions was applied to the *Epigaſtrium*, and renewed thrice a Day. Some Drops of *Laudanum* were given at Night to ſtop the *Diarrhæa*, and to procure Reſt. Mild Food and Drink were ordered.

The Suppuration ſeemed to advance outwards for four Days, the Doſe of the *Laudanum* being gradually increaſed to check the *Diarrhæa*, which frequently returned, but without any *Pus* in his Stools.

On the fifth Day the Tumor was evidently diminiſhed, ſofter and leſs painful; but he was faint, for which he had Sack-whey allowed him to drink ſometimes.

His Pultice and *Laudanum* were continued, the Tumor gradually diminiſhed, and his hectic Symptoms went off, without any obſerveable Evacuation of *Pus*; ſo that, *April* 26. he was diſmiſſed heal and ſtrong.

VI. A Child eight Months old was ſuddenly ſeized with violent *epileptic Fits*; after having had ſeveral, was let five Ounces of Blood at the jugular Vein, and ſoon after, being put into a Cradle, covered over with

a Cloth, loſt a conſiderable larger Quantity of Blood the Clothes about her being all wet, and the Child in a Faint, and very pale. She continued weak and pale ſeveral Days, but never has had any Return of the *Epilepſy*, though ſhe has ſince that time undergone all the common eruptive Diſeaſes.

VII. A Woman in the Decline of Life, and of a broken Conſtitution, had been ſeveral Weeks in a Rheumatick Fever, out of which ſhe narrowly eſcaped, after repeated Blood-lettings and other Medicines. Two Years after ſhe was ſeized with the ſame Symptoms which had appeared in the Beginning of the former Fever, to wit, Anxiety, Thirſt, Vomiting, Pains of the whole Body, and particularly of the Head, with a high quick Pulſe; ſhe was taken ill in the Morning, and in the Evening fourteen Ounces of Blood were let at a Vein of the Arm, which gave her little or no Relief. In the Night-time the Blood burſt out again at the Orifice of the opened Vein, and beſides wetting all the Bed-cloths, was lying in Clots at her Side before it was taken Notice of. A clean Bandage being then applied, ſhe fell aſleep, and awaked next Morning free of all Complaints.

VIII. In *January* 1739, a ſharp Pain ſtruck into my Right Eye, then gradually

ſeized

ſeized all that Side of the Face, contracted the Eye-lids, made the Tears ruſh out, and affected all the Teeth of the Upper-jaw. It began between 10 and 11 o'Clock in the Morning, increaſed till about four in the Afternoon, decreaſed till ſix, and then went off, without a critical Evacuation of any kind, ſo far as I could obſerve. In the *Paroxyſm* my Pulſe had no Diſorder in it, and in the Intervals I was as well as ever. The Inconveniency of Confinement at that Seaſon of the Year, and the Hope of each Fit being the laſt, made me ſuffer theſe periodical Pains ten Days, without trying to remove them by any Medicine.

The Pain increaſing daily, and making me at laſt unable to do my Work, I let ten Ounces of Blood, and took a Vomit a little time before I expected the *Paroxyſm* would begin. The Vomit operated ſeverely, but did not prevent the Return of the Pain, which continued till the Medicine began to go downwards, when I was relieved; and having purged twenty times before Night, I had no more Return of the Diſeaſe.

Since that Time I have cured ſeveral of this Diſeaſe, by giving them a Vomit and a brisk Purgative ſoon after this Operation was over, if there was no Appearance of the Emetick's acting alſo as a Purgative.

VIII. A Man brought a *Quartan Ague* and the *French Pox* from *England*, the Ague was in vain attempted to be cured by the common Remedies, and in the mean time the Pox advanced, the nocturnal Pains increaſed, and the foul Ulcers in his Throat ſpread; his Phyſician, (who is one of your Number, and from whom I have this Account) gave him five Grains of *ſweet Mercury* at Night, immediately after the Fit of the Ague was over; repeted the Doſe next Morning and Evening, and the Morning of the following Day. After taking theſe four Doſes of *Mercury*, he had a Fit of the *Ague*, which was more ſevere than any he had formerly undergone, the Fever being higher, with *Delirium*, but without any other bad Symptom. After the Fit was over, the *Mercury* was repeated as formerly, till the Salivation roſe. He never had more Appearance of the Ague, and the Venereal Symptoms diſappeared by the Uſe of the *Mercury*.

I was willing to borrow this Caſe, becauſe ſo far as relates to the *Ague*, it was an unexpected uncommon Cure of a Diſeaſe little known in this Country, the *Quartan Agues* not having been ſeen here, except produced in other Countries, untill within the laſt ten Years, in which they have been ob-

obſerved in ſome Parts of the Country, but have not been general.

XLVIII. *Of Nervous Fevers; by* EBENEZER GILCHRIST, *M. D. communicated by Dr.* WILLIAM COCHRAN *Fellow of the College of Phyſicians in* Edinburgh.

SOme further Experience and Reflection have confirmed me in the Notion I formerly communicated of *Nervous Fevers* (*a*), both as to the Diſeaſe, and the Method of Cure. Allowance, indeed, muſt be given for what could be then only rudely ſuggeſted in the Beginning of an early Practice. The following Thoughts will render that Eſſay more complete. I give them in form of looſe Hints, to be improven or rejected according to every one's Reaſon and Obſervation. If any ſeeming Contradiction, Obſcurity, or want of Connection ſhall appear, I muſt intreat the Reader's Favour, becauſe, in limited Undertakings of this kind, there is not room for a large Explication of Things.

(*a*) Med. Eſſays, Vol. IV. 23.

The Subject, in the manner I have treated it, is difficult; having more in it than is commonly imagined; and the Path is hitherto, in a great meaſure, untroden. Though a great deal has been ſaid upon Fevers, here there is ſtill much wanting. A Diſeaſe ill underſtood in Theory, muſt leave us in great Uncertainty, and will introduce frequent Miſtakes in Practice. Whether this Aſſertion is true, with reſpect to the Subject in hand, muſt appear from the Obſervations now to be made; wherein I have preſumed once more to offer ſome other and more determinate Proofs and Conſiderations relating to it, in order to ſet ſome things in the cleareſt Light I am able; and this Attempt, even though it ſhould prove unſucceſsful, will notwithſtanding I hope be encouraged. If the Principles and Facts ſhall be found true, and the Reaſoning juſt, there is a Method laid down, and Matter for a much more regular and extenſive Performance. To give this all the Advantages poſſible, I have been obliged to bring many things into narrow Bounds, which makes the whole too crouded: But moſt of what is ſaid, may be conſidered as a Text, or Inſtitutes hereafter, perhaps, in a proper Time and Place, to be enlarged on. And that it might anſwer more fully the Purpoſe of this Collection, I have, wherever an Op-

Opportunity has offered, thrown in ſuch uſeful Remarks as naturally occurred, were ſomeway neceſſary to ſtrengthen the Argument, and have a plain Tendency to the Improvement of Medicine in general.

There are many who cannot conceive of a Fever, without the Notion of Fire, Heat, or ſome very active irritating Cauſe; and in many Fevers, I own, there is good Reaſon to have ſomething of this Kind in View: But our Fever has ſomething peculiar in it, which neither Antients nor Moderns perhaps have deſcribed, if at all thought of. The *Cauſus* of the Antients, however ſimimilar in ſome Symptoms, appears to be a very different Diſtemper. They knew as little of it as of our modern Diſeaſe, *Lowneſs of Spirits.* Theſe two have ſuch a ſtrong Likeneſs and Connection, that I always conſider them as one, only with the difference of acute and chronical. The one is to the other what a ſimple Hectic is to a continual Fever; ſo that Vapours may be called an habitual nervous Fever, and a nervous Fever, acute Vapours. As the Reſemblance is continually, in every Inſtance almoſt, preſenting itſelf, a Parallel equally entertaining and inſtructive might eaſily be made betwixt them. They would mutually ſupport and illuſtrate each other, which

would give us a juſter Ætiology of both Diſeaſes, aſſiſt us likewiſe in the diagnoſtic and prognoſtic Parts, and point out more certainly the moſt proper curative Intentions in all, but eſpecially in delicate and perplexed Caſes.

As *our* Fever ſeems to be peculiar to this Age, it is not a little ſurpriſing that much more has not been ſaid upon it. Some ſcattered Hints are to be found in late Authors, both juſt and ingenious, but not ſufficient to make out a Syſtem of the Diſeaſe. Nothing therefore but diligent Obſervation and cloſs Attention, can let us in to the Myſtery of it, both in its Nature and anomalous Changes. I call them anomalous, becauſe however agreeable to the Genius of the Diſtemper theſe Changes may be, we can form no Notion of them from the Standard in other Fevers; which from the Beginning to the End, proceed in one conſtant Tenor, and for moſt part we know what is to happen in them.

Formerly I thought I had Reaſon to place the Cauſe of the Fever, as it was then, in a *Lentor*, with ſome Degree of Inflammation, and a *Spaſm* conſequent of them; from which the Degree of Malignity was to be determined. I thought too, that even what appeared to be a ſimple inactive *Lentor* might be equally malignant,

gnant as when it is attended with either Inflammation or Acrimony; which I advanced, to ſhew the Neceſſity of diſtinguiſhing betwixt the Fever and *Delirium*. To illuſtrate then and confirm theſe Things, let us ſuppoſe the firſt Degree of the Fever, proceeding, *viz.* from a *Lentor* without Combination, and entring as far as we can into the Nature of things, endeavour to trace the Diſeaſe thro' ſome of its Intricacies.

Tho' this firſt Degree of the Fever was ſeldom mortal; yet ſometimes by Reaſon of a *Delirium* that came on at an uncertain Time, and without giving Warning, it became dangerous and ſurpriſing. A mild *Viſcid* in the Blood, ſo I chuſe to call it, but ſtill of the Rheumatic Kind, while it can be circulated, will excite a Fever of a mild kind; by which Nature endeavours to attenuate and re-aſſimilate the offending Matter. When it is more difficultly circulated, or apt to form Obſtructions, it eaſily fixes upon this or the other Part, ſo as to occaſion Pains, wandring or more fixed, univerſal ſlight Rheumatiſm, *Lumbago*, *Sciatica*, and in the Breaſt a ſlighter Peripneumony or Pleuriſy. Such was the Conſtitution in many Caſes, where I was willing to ſuppoſe this ſimple *Lentor* only. Theſe Pains and Ailments came on at very uncertain Times of

the Diſeaſe, ſooner or later, and were eaſily changed, one into another; *e. g.* a fixed *Iſchiatic* Pain going off, was ſucceeded by a *Delirium*; or Pains of the Sides went off in more univerſal Pains. A *Delirium* came on, ſometimes, the firſt or ſecond Day; at other times not till the Diſeaſe was ſuppoſed to be at its Height; and when, in the Progreſs of it, I judged the Patient ſhould have been ſafe from this Irregularity of the Diſtemper, he was brought into the greateſt Danger. Nay the ſame Diſeaſe ever varying, was ſometimes an Apoplectic Fever, and ended in a Palſy.

The Matter of the Diſeaſe, in ſo many Shapes, muſt have been very moveable, but not eaſily attenuated, from its being either too ſizy, or the Fever too low to diſſolve it: But by a juſt Degree of the Fever continued, this Viſcid diſpoſed to form Obſtruction in different Parts, and thereby give the Idea of a Rheumatic, Pleuritic or other Fever, was ſometimes diſlodged, and the Diſeaſe returned to its firſt Type, a ſimple Fever. At other times, though this obſtructing Matter was diſlodged, it would have been thrown upon the Brain, and at a Time when I expected a Concoction of the Matter, and Termination of the Diſeaſe. As this Matter, therefore, is eaſily tranſlated to the

the Brain, and at very uncertain times, it ſhews the Neceſſity of doing ſomething early to attenuate it, and break the Fever, which of itſelf, without a *Delirium*, was often eaſily ſubdued; and we are carefully to watch the Changes of the Diſeaſe, even that which we expect to be a *Criſis*, which, inſtead of being ſalutary, may be a Tranſlation to the Brain itſelf; or rather all the animal Powers weakned by the Fever, and the Matter of it not ſubdued, it is here depoſited. What Apprehenſion then muſt we have of this Change, or of the Diſeaſe ſubſiſting in this Manner? It is now very different from what it was, the original Form and Idea of the Fever being loſt in that of a ſimple Obſtruction of the Brain without a Fever.

We are now then to ſuppoſe an inactive *Lentor* loading and obſtructing the Brain, and not a ſufficient Degree of Fever to reſolve it; for I judge the Fever to have ceaſed when the Matter of it was thrown upon the Brain. The Patient, in this Caſe, is without Fever, or what Fever he has is ſymptomatical; the Pulſe is low, flaccid, and very little increaſed in Quickneſs; he lies without Senſe of Pain or Sickneſs, raves without Furiouſneſs when awake, but for moſt part ſleeps compoſedly. This Sleep is

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properly a *Veternus*, or the Sleep of old People, nor muſt you be ſurpriſed when I ſay that ſuch die of old Age, which happens for want of a due Circulation into the extreme Parts, from the Brain not doing its Office: No Matter what that Office is, or from what Cauſe it may be hindred, the Effect is ſtill the ſame, and there is only required an appropriated Method of Cure.

This Obſtruction happening in a low State, or where the Circulation cannot be raiſed high enough to reſolve it, produces a great Variety and Perplexity of Symptoms, which cannot be accounted for from the Fever that has preceeded, for that is now much over. While the Idea of the Fever only is retained, the Appearances will be myſterious and deluding, and we ſhall never be able to ſpeak rationally and intelligibly of them; but if we preſerve the Notion of the Fever in that Degree in which it exiſts, and principally of an Obſtruction of the Brain too, we ſhall know what Symptoms ariſe from the one or the other, or both conjunctly.

When this Obſtruction then is formed, which, with reſpect to the Fever, we ſuppoſe a *Criſis*, the Secretions made in the Brain for the Uſe of the ſeveral moving Powers through the Body, will be diſordered and leſſen-

leſſened, or their Action, whatever that is ſuppoſed to be, is prevented. Theſe Powers thus deprived of the full and neceſſary Supplies for Motion and Senſation, that univerſal Mechaniſm, *viz.* a Fever, which is employed in preparing and carrying off the Matter of Diſeaſes, is not performed. And though there may be ſome Remains of the original Fever while this Mechaniſm is not performed, it is the ſame thing, at leaſt for the time, as if there was no Matter to be ſubdued; that is, while the Brain is thus oppreſſed, and hindred from doing its Office, all the neceſſary Motions are in ſome ſort ſuſpended, and Nature remains in an inert incapable State, which is the ſame as if there was no Diſeaſe. We may conceive of this from the Notion we have of a State wherein all Senſe of Pain and Sickneſs is taken away by Opium.

But though, from the Cauſes mentioned, a right Degree of the Fever is prevented, yet if there is any ſmall Remains of the original Diſeaſe, the Matter of it, ſo long as the Circulation continues, will be ſtill accumulating, and Nature will be forced to exert her utmoſt Power to conquer theſe Remains; and I have obſerved plain Paroxyſms every ſecond, third or fourth Day, or twice in three Days, according to the Kind and Quan-

Quantity of the Matter thus accumulated. From this we flatter ourſelves with a Change of the Diſeaſe to intermittent; the only Chance indeed the Patient has to overcome it. I have never met with one where this ſucceeded, the Reaſon is plain: This Paroxyſm is regular, has encouraging Signs, even a laudable Sediment in the Urine: All this may happen notwithſtanding an Obſtruction of the Brain, which, ſtill continuing, daily weakens the animal Powers, and every Paroxyſm adds to the Obſtruction till the Patient languiſhing dies, without receiving any Benefit by this expected Change of the Diſeaſe from continual to intermittent.

This is the loweſt Kind of the Fever, for which I was never ſo lucky as to find a Remedy, proceeding from a *Lentor* the moſt inactive, moveable, but not eaſily diſſolved, and that from the Want of a due Force of Circulation; it may indeed be diſlodged, but not ſo attenuated as to prevent its forming Obſtructions anew.

Having deſcribed in ſome Meaſure this Kind of the Fever, and accounted for ſome of the many Appearances of it, when proceeding from the moſt ſimple Cauſe, it may be eaſily imagined what yet greater Variety of Symptoms will happen when there is a Com-

Combination of Acrimony and Inflammation. Reaſoning thus from the more obvious Cauſes of ſuch a Fever, and from the Method of Nature in other Diſeaſes, where there is a plain Analogy, is the ſureſt Method to arrive at the higheſt Knowledge we can have of the Diſeaſe. In highly malignant Fevers, where the Symptoms are abſtruſe, and Cauſes leſs evident, we muſt have Recourſe to the Doctrine of Poiſons to help us on in our Enquiries.

According to the Nature and different Modifications of the Matter of Diſeaſes, it exiſts through a vaſt Number of different Series of Veſſels, in an almoſt infinite Subordination, carrying Blood, primary and comprehenſive of all the reſt, *Serum*, Lymph, nutritious Juice, *&c.* or ſome other highly refined, volatiliſed, ætherial Fluid, contained in circular Canals or Cells. It is not till after a certain Elaboration that theſe Cauſes are perfected, ſo to ſpeak, or produced into Action; and it is in their proper Veſſels that the Fluids acquire a particular morbid Quality. A Gout is not a Rheumatiſm, a Pleuriſy is not a Gout; what would be the Cauſe of a Diſeaſe in the Blood-veſſels cannot reach the Lymphaticks; nor will a Diſeaſe exiſting in this Series of Veſſels have any more than a remote Effect upon the other.

ther. While a vitiated Fluid, belonging to an inferior Order of ſmall Veſſels, is involved in the general Maſs, it may be eaſily carried about in the common Courſe of Circulation, without occaſioning any great Diſturbance in the OEconomy; but, ſeparated into its proper Order, it will exert its Power as a morbid Cauſe, which may in ſome Meaſure be owing to the Veſſels themſelves being too lax or rigid, more or leſs permeable; and though the Vice of a particular Fluid may, by every repeated Circulation, be in part ſubdued in the larger Veſſels, yet in its own Veſſels it is ſtill aſſuming the morbid Quality, becauſe in theſe it does not ſuffer a due Subaction, as in the larger Veſſels, when immediately under the Force of the Heart and Arteries.

A highly acute effluent Fever, whether ardent or inflammatory, has its Seat in the Blood-veſſels. *Ardency* in Fevers ſuppoſes ſome peculiar Quality of the Blood, as compoſed of red Globules, which may be compared to Fire, or what elſe we pleaſe, affecting the Heart and Arteries immediately, and ſtimulating them into more frequent and forcible Contractions. The ſimpleſt Idea we have of Inflammation is an Obſtacle in the evaneſcent Arteries, which oppoſes itſelf to, or acts againſt the immediate Impetus of the Heart,

Heart, and ſo occaſions an equal Re-action of the Heart, or an Increaſe of the ſyſtaltic Motion. Here we have Inſtances of Cauſes acting in a certain Order of Veſſels.

Ardency and *Inflammation* may be both with and without a *Plethora;* for Repletion is not eſſential to theſe, but they are greatly increaſed when this is joined to them: On the other Hand, there is equal Danger, when, under *Ardency* and *Inflammation*, there is a Want of Blood, becauſe the Force of Circulation falling below the Standard, it is with the greateſt Difficulty that we can obtain a Reſolution and Coction. This exhibites to us a Species of *nervous Fever*, where the Cauſe exiſts in the largeſt Order of Veſſels: For, to give a ſhort and ſimple Definition of it, a nervous Diſeaſe is no more than a morbid Cauſe acting in a low State; that is, where, from a Defect of good Blood, there is not a due Force of Circulation to overcome it.

But, according to the Order of Veſſels in which the Cauſe of the Fever exiſts, the Diſeaſe will be more or leſs acute; that is, the more remote the Cauſe is from the Heart, or the farther it is removed from the immediate Force of Circulation, which is confined to the Blood-veſſels, it becomes leſs active; and as we purſue this morbid Cauſe

paſſing

passing into different Series of Vessels, smaller and smaller, we insensibly lose the Idea of Acuteness, which is always according to the Influence such Cause has upon the Heart and Arteries; for it may at length be so far removed from the Heart, and become so inactive, as to occasion no more perhaps than something like an *intestine oscillatory* Motion of the ultimate Vessels and Fibres, but which may indeed in time affect the very *Modus* of their Cohesion itself. This is the true Gradation of a Disease, in which we have an easy View of it in a regular Progression, from its lowest chronical Denomination to the highest Degree of Acuteness.

The Body being considered as a *Congeries* of Vessels of various Orders, carrying each the Fluid proper to it, it deserves an Enquiry how or by what Means these different Fluids are moved on in their respective Canals. Setting aside the Power of the Heart as the first Spring of Motion, the Arteries bear a very principal Share in the Movements in the animal *Compages*; not by the internal Motion of the Blood propelled by the Heart, for the Supply of all the subordinate Vessels, but by their external Pulsations. And here we shall see by a new, a simple, but highly artful Mechanism, the Impetus of the Heart continued upon these Ves-

Veſſels to which the projectile Force could not extend; for this does not ſeem to be communicated beyond the firſt and great Syſtem of Veſſels.

The Arteries then are diſperſed by innumerable Branches, larger and leſſer, to every Part of the Body, for two great Purpoſes, the Diſtribution of the Fluids, and to impart Motion. So far as we can trace the Arteries carrying red Globules, we obſerve a regular and forcible Pulſation, at leaſt in the larger Trunks and Branches which have their Sides dilated, or in feeling an Artery we think ſo. But betwixt the various Ramifications is comprehended an infinite Number of Veſſels of leſſer Orders, which from their Figure and Texture, ſo far as theſe are known, or from any Power they may be endued with in themſelves, or can receive from the Heart, are not ſuppoſed fit to propel the Fluids in them. When there is a Sufficiency of Blood in the Arteries to keep them fully diſtended, the ſmaller intermediate Veſſels are, by the continual Pulſation externally, compreſſed on all Sides; and it is by this conſtant Preſſure in repeated *Ictus* that the Fluids in them are moved on. When this is the Caſe, all the natural Secretions and Excretions go on regularly, which gives us the proper Idea of an healthful State,

and which is no other than a continual equable Circulation through all the Orders of Veſſels. We muſt form ſome Notion of this from what is done in the Lacteals and Thoracy Duct, which have no proper motive Power in themſelves, but their Contents are forced on in them by the ſole Action of the circumjacent Parts; or this Power of the Arteries externally excites ſuch a conſtant Action through the whole Body, as may (if I am forgiven the Compariſon) be repreſented by the moſt gentle and alternate ſqueezing and relaxing of the Hand when cloſe ſhut.

But when there is not a Quantity of Blood in the Arteries ſufficient to keep their Sides duly diſtended, little or no Force will be impreſſed upon the intermediate Veſſels to urge on the Fluids in them: And 1. There will be a ſlower Motion, or ſome Degree of Stagnation in the ſeveral Orders of ſmall Veſſels. 2. The Fluids ſtagnating or moving ſlowly will follow their own Diſpoſitions, and acquire ſome particular Acrimony, too great or too ſmall a Degree of Coheſion, or ſuffer ſome other Change we can only imagine. 3. The Fluids not being quickly enough circulated in the ſmall Veſſels, there will be a ſlower Return of them into the larger, by which theſe will remain in a certain

tain Meaſure exhauſted. 4. From an Imminution of the general Quantity, and want of Force to impel the Fluids into them, the very remote Veſſels will be deprived of their Proportion; hence ſome Degree of a collapſed State. 5. Some of the different Series of ſmall Veſſels will by degrees ſuffer Diſtenſions, and ſo have their Amplitudes enlarged; which, 6. may at laſt bring on a Redundancy in thoſe Veſſels; whence, 7. muſt ariſe particular Compreſſions and Stagnations, and farther Interruption to the regular eaſy Tranſmiſſion, and refunding of the ſeveral Fluids through all the Orders of Veſſels. And thus from a Combination of mutual Cauſes the original Default continues and increaſes; ſo far we conceive of a Diſeaſe without a Fever.

But though a ſmaller Degree of a morbid Cauſe in the ſmall Veſſels may not greatly affect the Circulation in the larger, yet when this Cauſe is much accumulated, and becomes active; then, from the univerſal *Conſenſus*, or that all the Fluids may not partake in ſome Degree of the morbid Cauſe, a general *Stimulus* will be induced, which being communicated to the Heart and Arteries, the Diſeaſe puts on the formal Type of a Fever, in order to ſubdue the offending Cauſe, and reſtore a juſt Balance of Circu-

lation amongſt the ſeveral Orders of Veſſels. This Tranſition from chronical to acute may, according to Cauſes, be either ſudden, or ſlow and more gradual; but we eaſily perceive that Nature muſt here labour at great Diſadvantage, becauſe there is great Defect of Fluid in the Arteries, or the Cauſe of the Fever acts principally, and is ſeated in ſome diſtant Series of Veſſels. May not then, in a ſtrict Senſe, a nervous Fever be ſometimes called ſymptomatical of a Cauſe acting in ſuch a remote Order of Veſſels? theſe only being to be accounted genuine Fevers, whoſe Cauſes act chiefly and immediately upon the Heart and Arteries. The Remiſneſs of Symptoms is ſuch ſometimes, that we cannot imagine the Blood-veſſels to be otherwiſe than ſecondarily affected.

This Sentiment, rightly purſued and improven, I would call a Key to the right underſtanding of nervous Diſeaſes in general, and may be applied both in acute and chronical Caſes. An Obſtruction to Motion; particular Acrimony or Viſcidity; a Diſtenſion, and ſometimes Redundancy in this or the other Order of ſmall Veſſels; irregular Compreſſions of theſe, and want of Blood in the larger, will account for the various ſpaſmodic Affections, ſudden and uneaſy Senſations, well felt, but not eaſily deſcribed;

bed, Failings, Depreſſions, diſorderly Secretions and Excretions, irregular and ſeemingly contradictory Symptoms happening in chronical nervous Diſeaſes, from the loweſt Degree of a vapouriſh Ailment to the higheſt capital Diſtemper. Nor without ſome ſuch Principles ſhall we ever be able to receive clear Apprehenſions of the ſeveral Kinds and Degrees of nervous Fevers, nor of the Symptoms that accompany them. Theſe Fevers, for Conveniency, may be diſtinguiſhed in the ordinary Way, into nervous,——ardent,——inflammatory,——rheumatic,——intermittent,——lymphatic, beſides what may be called leipothymic Fever, and Fever of the Spirits. I do not ſpeak of nervous Diſeaſes with Repletion, though the Reaſoning may be eaſily adapted to theſe too, and will alſo give us a juſt Notion of an influent ſcorbutic Diſtemper, the fruitful Parent, for moſt part, of every Diſorder of this Kind.

This is not a proper Place to enumerate particularly all the remote Cauſes that may bring on ſuch a Diſtemperature of the Fluids, or State of the Solids, as may be ſuppoſed capable of producing a nervous Diſeaſe, and explain mechanically how theſe act, nor to condeſcend upon the many occaſional Cauſes that can put the Matter of a Diſeaſe into

Action, ſo as to give it an acute Form; neither do I ſay any thing of that general Laxity, and Tenſion or Irritability, which, in ſome Degree or other, are ever Concomitants of the Diſeaſe; we are too much confined here, I ſay, to enter upon a nice Diſquiſition into theſe Matters.

But a rational and frequently ſucceſsful Practice is plainly deducible from the foregoing Theory. In chronical Diſeaſes we endeavour to make up the Want of a due *Impetus* from the Heart, upon the ſmaller intermediate Veſſels, by an Increaſe of muſcular Motion; or what is equivalent, in a long and conſtant Courſe of Exerciſe of all Kinds, Walking, Riding, Friction, Bathing, by which their ſluggiſh Contents are preſſed on, giving at the ſame time ſuch Medicines as are ſuppoſed to attenuate all Coheſions of the Fluids in the extreme Veſſels, ſtrengthen their Tone, remove Acrimony, and ſtore the Blood with mild, balſamic, active, invigorating Parts; and becauſe this Method of muſcular Motion cannot take place in acute Caſes, another and particular Kind of Exerciſe, *ad vaſa*, is inſtituted, by bliſtering, which has a certain and powerful Effect upon the whole Frame, and is eaſily underſtood from the Nature of an animal Fibre. We are here likewiſe to give proper Attenuants,

nuants, together with warming effluent Remedies, to raiſe the Pulſe, and *Antiſpaſmodics*, becauſe of the *Orgaſm* that is inſeparable from Acuteneſs; ſtill remembring by Plenty of ſuitable Drinks, and a greater Quantity of Food than can be allowed in other Fevers, to keep the large Veſſels conſtantly full, and in equal Degree of Diſtenſion, that a due Preſſure may be communicated to the ſmall Veſſels. The Goodneſs of the Pulſe in this Fever is determined from the Fulneſs, not the Frequency of it.

This Fever diſappeared with us for ſeveral Years, but of late has again appeared, and with ſuch different Circumſtances, as conſtitutes a new Species of the Diſtemper; it would be beſt underſtood by enumerating the ſeveral Symptoms that accompany it, which though they do not all concur in one, yet in different Subjects are all to be met with.

The Fever runs out to the twentieth, twenty fifth, thirtieth, and ſometimes to the thirty fifth Day: The Symptoms, upon Seizure, are generally ſuch as are common to all Fevers, Coldneſs, trembling, and frequent Alternations of Heat and Cold, *Nauſea*, Head-ach and vomiting; while at other times it draws on more inſenſibly. A quick Pain of the Loins or *Coccyx* preſa-

ges a Fever of a bad Kind, as indeed an acute nervous Pain any where does. In the Beginning there is ſometimes Appearance of Fulneſs and Acuteneſs, ſo as to require bleeding, and the Blood has not the ſizy Cruſt at Top; at other times they are altogether without theſe. The firſt Days they often ſweat profuſely, continually or more periodically, and the Diſeaſe appears to ſome like intermittent, eſpecially if the Urine drops a plentiful lateritious Sediment; but, as the Fever advances, theſe Sweats go off as well as the Sediment of the Urine, which now becomes crude, pale, and almoſt taſteleſs, and may continue ſo through the whole Courſe, till a Tendency to Coction, or ſome Accident ſaturate it, and diſpoſe it again to ſubſide. The different Appearances in the Beginning make no Alteration of the Diſeaſe in the Progreſs. From the ſeventh or eight Day, ſooner or later, a *Delirium* comes on, which is conſtant, and laſts through the Fever, but for moſt part is not very high; the Tongue is black, chap'd and parched. The Sick are faint, highly diſpirited, ſigh heavily, and, when the Fever is vehement, have a nervous or intercepted Breathing, Cough and Hiccough, and ſometimes feel extreme Coldneſs. The Pulſe is quick, ſmall, weak or flaccid, and, at laſt, has frequent

Inter-

Intermiſſions. We often meet with Signs of Colliquation, ſuch as Sweats, with the Extremities cold, and pale Urine, with a fatty Pellicle; a ſymptomatical Looſneſs, or Deafneſs, or both, accompany it to the End. What deſerves a ſerious Conſideration, is the frequent Hæmorrhages, or bloody Appearances that happen. I have known them bleed four or five Pounds by the Noſe in a few Hours: Bloody or ſanious Stools, and very fœtid are obſerved; the Diſeaſe does not continue long after theſe, or the Sick do not long ſurvive them; even a bloody Expectoration, if carefully watched, will be often found, or what is hauked up, will be lightly tinged with Blood. This laſt is ſeldom attended with Stitch or Pain, and commonly paſſes unheeded. A *Subſultus* is common, but is not great. Seldom do they die ſoon in the Diſeaſe, though it has been fatal before the fourteenth Day, and ſome have died with Convulſion.

The Diſeaſe, before it makes its Attack, gives ſufficient Warning ſometimes. Two or three Weeks before they are laid down, they are low ſpirited, inappetent, loaded, ſleep ill, ſigh frequently, groan involuntarily, and feel inexpreſſible Diſorder, accompanied with great Fear, Concern and Dejection, and perhaps ſlight Alienations of Mind,

Mind. Sometimes they have unſufferable Headach, which continuing through the whole Fever, is the only thing complained of. This *Apparatus* to the Diſeaſe ſhall, if I am allowed, be called the *chronical Stadium*, preceeding immediately the *acute Period*, or that which may be called the formal Seizure.

Before this perhaps they have expoſed themſelves indiſcreetly to the Sun, or fatigued in it, eat largely of Fruit, drank bad Wine or Spirits, which brings on a terrible Parchedneſs and Stricture; or, they have been long under a Courſe of Anxiety, Care, Fear, Diſcouragement, and other enervating Paſſions; together with Irregularities of Diet, and manner of living, which cauſe a bad State of the Juices, as well as a depreſſed State of the Mind. Thoſe, on the contrary, who have not ſuffered from the Habit and Exceſſes of Paſſions, or felt the Severity of thinking; who have lived freely, yet regularly, and have been accuſtomed to drink of generous Liquors with Diſcretion, being ſeldom the Subjects of this Diſeaſe.

Theſe are the material Symptoms, and principal Cauſes of the Fever, and ſufficient to diſtinguiſh it from the Species formerly inſiſted on. As there is ſuch a remarkable

Diſ-

Difference in the Appearances, there muſt alſo be in the Cauſe: And I beg leave ſtill to make a Conjecture upon it. If the Diſeaſe formerly was ſuppoſed to conſiſt in a *Lentor* chiefly, I think it has now plain Signs of *Acrimony*. *Acrimony* is a Cauſe ſufficient to bring on a Fever of this Kind, by giving an univerſal *Stimulus*. The Symptoms may be accounted for from this; and we ought to have every aſſignable Cauſe before us, if we would ſatisfy ourſelves as to the Difference of Diſeaſes, and different Conſtitutions of the ſame Diſeaſe. For inſtance, a general Conſtriction from this Cauſe will, by forcing the Blood inwards, occaſion Coldneſs of the Extremities, Lowneſs, Fainting, Oppreſſion and inward Struggle, the ſpecial Characteriſticks of the Fever, which it has in common with the other Species, but in a more remarkable Degree. Nay this *Conſtriction* and *Acrimony* may bring on a particular Stagnation or Obſtruction; which by their Weight and Eroſion, may cauſe a burſting of the Veſſels; and hence will ariſe Hæmorrhages and bloody Excretions, which may be partly critical, partly ſymptomatical. Has not this particular Symptom, of the Blood being apt to come ſo many ways, ſome Reſemblance with the ſame Appearance in a bad Small-pox?

But

But the Principles and Reaſoning here will ſeem too general. In order to underſtand clearly an Effect, we ought to find it in its proper Cauſe; and rightly diſcriminating amidſt various Connections, and ſimilar Appearances, endeavour to produce every Cauſe ſimple in its Origin. I ſay then, a general Conſtriction of thoſe Parts that are endowed with a greater contractile Power, will neceſſarily throw the Fluids upon theſe that are weakeſt. Parts are ſaid to be *weak* from their Texture and Situation; when they are not ſtrong enough of themſelves to reſiſt, or are not ſufficiently ſtrengthned by the ſurrounding Parts, againſt the Influxes of the Fluids; or when they do not receive a due pulſatory Force from the Arteries, or Action of Muſcles, to promote the Circulation in them. Under this Head are comprehended all the ſmaller Order of Veſſels, even the Arteries themſelves, which laying aſide their muſcular Coats, become, perhaps, in their Extremities ſimple Membranes. —— Many of the Organs and *Viſcera*, in a ſpecial manner, the Brain, are evidently, both from the Texture and Situation, weak Parts. — And ſuch I would reckon the whole Syſtem of Membranes and Glands: — Which laſt, from the manifold Contortions and Implications of their Veſſels, and ſlow Motion

of

of the Fluids in them, are apt to ſuffer the ſame Accidents as Parts that appear weaker.—— The Membranes are largely ſpread out, to give Coverings to all the Parts, to preſerve their Texture, to keep them in their Situation, and facilitate their Motions.— We muſt here conſider particularly the celluloſe Membrane, which is propagated in an inconceivable Manner, to the moſt diſtant and intimate Part; and not the ſmalleſt Veſſel, perhaps muſcular Fibre, or interſtice, but is enveloped or occupied by it (*a*).—— The Membranes, whether compacted or cellular, are every where provided with numberleſs Glands for ſeparating certain Liquors;— and the Cells are filled with a rich concreſcible Oil, oily Mucilage, or gelatinous Lymph, for lubricating and nouriſhing the whole Body.——— The Membranes are liable to the common Indiſpoſitions of ſolid Parts.——— And the Liquors in the Cells may, from a peculiar Taint or Ferment be heated, fuſed, and rendred acrimonious, and not concreſcible; and ſo become a rancid, eroding, infecting oily Solution, and eaſily abſorbed, or loſing their mild adheſive Properties, they are turned into a foul, acrid, corrupted, vapid *Latex*.——— When the Li-

(*a*) See Douglaſs's Deſcription of the Peritonæum.

Liquors in the ſmall Cells are much exhauſted, and the Remainder not ſufficient to fill and lubricate them, the Cells collapſe, and the Membrane becomes dry, inflamed, rigid and leſs pliant. —— There is an univerſal Continuity of Membranes, which are ſuppoſed to be Productions of thoſe within the Head, and, in many Caſes, are found to be highly irritable. —— Wherever a morbid Cauſe is ſeated, or acts principally, thither is the greateſt Force of Circulation determined; and the Fluids will be derived in greater Quantity into ſuch Part or Parts, that thus the offending Matter may be concocted and diſlodged.— But when the general Maſs is diminiſhed, and the Circulation languid, the weaker Parts are not able to urge on their Contents, nor aſſiſted in returning them to the common Maſs; but the Fluids accumulating and ſtagnating in them, the Veſſels are overcharged. If theſe Things are granted, the Uſes will be abundantly plain. By this Method of inveſtigating we are led to diſcover ſome of theſe Cauſes upon which moſt probably the Symptoms depend; ſuch as Stagnation and Hæmorrhage, Tumor and Gangrene, ſudden adipoſe Conſumption, and fatty Appearances in the Urine, partial, wandering, internal Heats, and irregular Coldneſſes, clammy, glutinous, chill Sweats.

From

From an Inflammation of the Membranes, and their Glands obſtructed, or a *Stimulus* infixed, many Affections will ariſe, unobſerved often, and unimagined. Nor will it be difficult hence to conceive ſomething of a membranous Tenſion or a Stricture of the nervous Parts, when there may, at the ſame Time, be a great muſcular Relaxation. This Tenſion communicated to the whole Syſtem, eſpecially the Membranes of the Brain, will produce theſe Appearances from which we infer the Nerves to be affected: And they may be affected from Cauſes placed either in their Origin or Extremities: But to explain how the ſeveral Cauſes act, and Symptoms are produced, would be to enter upon a general Phyſiology. And becauſe theſe Reaſons and Proofs that may be convincing to me, might to others appear too remote or equivocal, I content myſelf with having only hinted at Things, being always willing, as the Subject eſpecially is purely conjectural, to leave doubtful Opinions upon the Foot of *Inquirenda*.

Profuſe Sweats happening in the Beginning are partly from *Colliquation*, but chiefly from an increaſing *Spaſm*, or the Effect of a general *Niſus* to overcome the Diſeaſe, or from a State of the Blood only tending to Diſſolution, which ſuppoſes ſome kind of Acri-

Acrimony; and being frequently miſtaken, are encouraged. Inſtead of being critical, or even relieving, they are rather badly *ſymptomatical*, *agoniſtick*, and no way *determining*. The Sick are thus far indeed relieved by them, that while Nature is ſtrong enough to force them, the Diſeaſe is ſo long kept outwards; and lying conſtantly bathed in Sweat, and warm, the Tenſion is taken off, and they think themſelves happy: But long fatigued with ſuch Sweats, eſpecially when forced, if they ſhould ſuddenly ſtop, and the Patient be very weak, no wonder if he is overwhelmed at once, and die unexpectedly, as has ſometimes been the Caſe. This has deceived many, who argue for the Neceſſity of Sweating, becauſe the Sick may find themſelves eaſy under it, and ſuffer great Diſorder when they have no Sweats, when really they are exhauſted by them, and the Diſeaſe is no way leſſened. For it is not yet aſcertained that in this Way the Diſeaſe is to be carried off. Not but that Sweating has ſometimes proved ſalutary, at a proper time, and under certain Circumſtances, tho' I think this ſeldom happens. But I beg it may not be laid down as the conſtant Method of Nature; and let the particular Genius of the Fever be condeſcended on before it is brought into a Rule. The Fever may

be

be carried off as well by other Methods, Perſpiration, Stool, Urine, diminiſhing the Bulks, altering the Figures of the ſtimulating Particles, or ſmoothing them, ſo as to render them leſs active, and fit for being excerned. Theſe Things will appear idle to arrant Practitioners; but if Reaſon and Philoſophy are allowed to enter into Medicine, they are at leaſt ſuppoſable. Matter, of what kind ſoever it be, is ſtill Matter, ſubject to certain and unalterable Laws; and we do not know the many poſſible Changes it is capable of from its Diviſibility, Figure, Attraction, and the Operation of extrinſick Cauſes, which may alter its Texture, or otherwiſe abate its Energy.

But to enter a little into the *Minutia* of Things, let us ſee how all this correſponds with a Theory. There is a conſtant *Niſus* and *Reniſus* betwixt the Blood and Blood-veſſels.—— A Fluid preſſes *undequaque*;—— and the Blood has an additional Force given it by the Impulſe it receives from the Heart, and by which it counteracts the Force of Arteries, that are continually endeavouring to bring their Sides together—— For the Arteries, from their particular Conſtruction, are alway in Contact with, ſo as cloſely to embrace the contained Fluid, and thereby reſiſt the too great Expanſion of them. This

is a wiſe Contrivance; and the Neceſſity of it is apparent for many Purpoſes of Life.

There is a certain *Equilibrium* here, which is the Standard of Health, and on either Side is a Diſeaſe. —— Beſides this natural Contractility of the Veſſels, there is a preternatural Spaſm brought on by the Fever;—and if the *Moles* of the Blood is diminiſhed the Capacities of the Veſſels will, from the Contraction thus increaſed, be brought within the Sections of their Diameters, as they are found in a natural State. This Fault of the Veſſels is removed two ways, by taking off the Stricture and increaſing the Quantity of the intervening Fluid; or, which is the ſame thing, cauſing the Fluid to expand, and occupy a larger Space, by which the Capacities will be again enlarged.

Of how much Importance it is that the Arteries have ſtill a Sufficiency of Blood in them, to keep their Sides conſtantly diſtended, that there may be always a full dilated Pulſation, has been ſhewn: For it is by means of this that a due Impulſe is made upon the ſeveral ſmaller Orders of Veſſels, to promote the Circulation in them. A general Defect of the Fluids ſeems to be almoſt eſſential to our Fever. The more therefore that is derived from the Blood by profuſe

Sweat-

Sweating, or any other increaſed Evacuation, leaves the Veſſels more exhauſted; and there is ſtill a leſs Quantity of Fluids to keep them diſtended, and to reſiſt their Contraction. I know it is ſaid the Loſs that is ſuſtained by Sweating, is repaired by the copious ſupplies of Drink the Sick are allowed. But this will not anſwer the End, if given ſtill with an Intention to promote the Sweating; for then it paſſes off as faſt as it is drank, and does not remain in the Veſſels, ſo as to add to the Quantity. Nor is it eaſy to gain upon the Spring of the Veſſels when contracted within the uſual Capacities; eſpecially when this Contraction is ſo much increaſed by a morbid *Stricture*. I have frequently thought it would be more prudent to moderate, at leaſt, the Flow of exceſſive Sweating that happens in the Beginning and Progreſs of the Fever. I do not think it will be argued that Nature, by ſweating, is carrying off the morbid Humors, or any Part of them; for this is not the proper Time. Theſe Sweats for moſt Part ſtop of themſelves, and though very plentiful, the Sick are diſappointed of the expected Relief. I very often divert them, and without the leaſt Hazard. Whether they ſweat or not, the Fever goes on, and the Diſeaſe is as often malignant and fatal when they have

Sweats as when they do not ſweat: Nay, from them, in many Caſes, I draw a bad Prognoſtick. The Retention of Sweats will only increaſe the fulneſs, which is a favourable Circumſtance; and if the Acuteneſs is thereby increaſed, we obtain what is chiefly wanted and intended by almoſt all our Adminiſtrations. If we ſay that theſe ſpontaneous Sweats are any way critical (and ſuch they muſt be, if they are in any Degree relieving) and therefore to be encouraged; beſides, that there is no certain Proof of this; it does not coincide with ordinary Notions of Coction. I believe there are Methods by which Coction may be haſtened: But when the thing is committed to Nature, it is not performed but in a determinate time; for in moſt Fevers there is a fixed ακμὴ, when the Matter is fully concocted; and not till then is it ever ſuppoſed fit to be carried off. The Sweats that happen in this Fever are the Effect of Nature. Can we then imagine ſuch Sweatings to be any ways critical in the Beginning, when the Fever of itſelf, nay, after all the Aſſiſtance of Art, ſhall not come to the Decline in leſs than Weeks? To pronounce with Judgment in this Point, we muſt carefully attend to Practice, and the Senſe of Authors of greateſt Note, who do not

not ſeem to lay ſuch a Streſs upon Sweating as is commonly done (*a*).

While I am writing this (*Novemb.* 1741) I meet with ſome Inſtances of a Fever like that formerly inſiſted on. It comes to an End about the 14th Day, and ſeems to proceed from mixed Cauſes, having Signs both of Inflammation and Acrimony; attacks inſenſibly ſometimes, and is highly malignant. As the Diſeaſe advances, the Sick are conſtantly almoſt under a *Coma* or Raving; and they die of an abſolute Oppreſſion of the Brain. About the 7th Day, profuſe Sweatings come on, followed by a manifeſt Aggravation of all the Symptoms. Upon this Account I have juſt mentioned it, and, upon the whole, after the moſt diligent Obſervation, I am ready to conclude there is no Relief, no Security by a Method of Sweating in nervous Fevers.

There is nothing we are ſo uncertain of as a *Criſis*; and it is of great Importance, (becauſe of the certain good or bad Influence the knowing or not knowing of it has upon Practice) to be well acquainted with the Methods of Nature in carrying off a Diſeaſe, as well as how it is brought on; to know whether the Diſeaſe finiſhes itſelf by a for-

(*a*) Freind Comment, 3.

mal, effluent, material *Criſis*, or ſtated Expulſion of the offending Cauſe; or, in ſome other leſs evident, but equally certain, and perhaps explicable Way. When a *Lentor* has cauſed the Fever, this *Lentor* continuing ſuch, is too groſs to paſs any of the common Outlets; but by repeted Circulations, and due Motion and *Momentum* of the Fluids, may be ſufficiently attenuated. When the Humours are brought to a right Degree of Tenuity, they are again rendred fit for Circulation, they become all ſound, no Cauſe of a Fever exiſts, there is no offending Matter to be expelled; and the Re-aſſimilation of the diſeaſed Fluids is the Solution of the Diſtemper. This Kind of *Criſis*, which for the ſake of a Name may be called *aſſimilatory*, to diſtinguiſh it from that which is properly *depuratory* or *expulſive*, will be very ſurpriſing to thoſe who wait for ſome more evident Signs of Termination, and want to have their Senſes ſatisfied by ſome notable Excretion; the vain Expectation of which, has probably diſpoſed them to treat the Diſeaſe in a way quite repugnant to Nature. When the Fever is brought on by an *Acrimony*, intimately mixing with, or adhering to the Blood, or ſeated in ſome remote Order of Veſſels, the Caſe becomes more obſcure and difficult; an acrimonious

Cauſe

Cauſe in all Diſeaſes being the moſt obſtinate. The Matter is here very ſubtile, and, in a weak exhauſted State, where the *vis vitæ* is remarkably deficient, cannot be diſengaged and accumulated, ſo as in a determinate Time to be carried off in a ſenſible, regular, material *Criſis*. In this Caſe we muſt wait Nature in the Courſe of a tedious Proceſs; which, before the Matter of the Diſeaſe can be, by gradual and inſenſible Methods, thrown out of the Body, or rendered bland by a Change of Texture, induced by repeated Circulations, may be lengthned out to ſome Weeks, without any ſenſible and ſalutary Excretion, Remiſſion of Symptoms, or Change of its Shape. This if rightly underſtood, not only gives a Reaſon for the uncertain, and ſometimes ſurpriſing lengthning out of Fevers, from this Cauſe, but greatly invalidates the Doctrine of *Criſes*, and critical Days, as known to and inſiſted on by the Ancients. When we meet with a thorough *Criſis*, that wholly and at once rids the Body of the Diſeaſe, we muſt ſuppoſe a Matter betwixt groſs and ſubtile, and perhaps mixed as to Qualities; and ſtill an increaſed Force in the Circulation to bring it to Coction, as well as to expel it. The ſhorter the Fever, the ſurer we are of a ſenſible *Criſis*.

I do not know whether I ſhall be reckoned perfectly right, and the Parallel juſt, when I compare a Fever, iſſuing in a ſtated, complete and ſalutary *Criſis*, to a Tumor that ends in a benign Suppuration, an Event that is always ſpeedy. A Fever again without a ſenſible *Criſis*, in ſome ſort, I think, reſembles thoſe Tumors that terminate by Reſolution, or in a languid Apoſtemation; either of which, in many Caſes, it is very hard to obtain. A Portion of Matter indiſpoſed for Circulation, and the Purpoſes of Health, confined to, and acting in a determinate Number of Veſſels of any Order, may form ſome external Ailment, a Diſeaſe of the Part. This ſame Matter diffuſed, increaſed in Quantity, or otherwiſe modified, may be made to occupy an entire Series of Veſſels, or more through the whole Body, and ſo will create an inward Diſtemper, affecting the Habit. A retroceding external Ill often excites a formidable Fever. A Fever, as often has the Matter of it diſcharged upon the external Parts: In both Caſes the Diſeaſe is under the ſame general, ſimple, uniform Laws; and according to the Remoteneſs or Proximity of the Cauſes, with reſpect to the Heart or Force of Circulation, according to the Agency, Attraction or other ſuppoſed Conditions or Properties of Mat-

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ter, ſo will the *Coction* and *Termination* be, quicker or ſlower, more or leſs favourable. I do not affirm any Thing, but this may be obſerved, that there is an exact Conformity betwixt Diſeaſes external and internal, and one gives the Clew, and is the genuine Index to the other. We can only reaſon conſequentially from Things cognoſcible by our Senſes, to thoſe that muſt be judged of by their Effects; and it ſeems to be the direct Way to attain the real and immediate Knowledge of a Diſeaſe, and to find out the true Intentions of a Remedy, the Fitneſs of it, the Time and Manner of Application, and the *modus operandi;* upon this Plan a great deal might be done, very profitable both in Science and Practice; I have juſt offered to ſhew how it is applicable to the preſent Subject.

In our Fever formerly I for moſt part obſerved a Looſeneſs to accompany the Diſeaſe about its Height, and was willing to think that it was a Motion of Nature to expel the now concocted Matter of the Diſeaſe; it was generally a good Sign about the fourteenth Day, and I can be confident in it, that no other Excretion was ever relieving, happening at or before the Height, whatever it was after it. I ſhall not deny that this Looſeneſs might have been ſometimes a real

and

and material *Criſis;* yet I cannot think but that it was rather an Effect of the Diſeaſe being ceaſed, which I place in a Re-aſſimilation of the Matter, and conſequently a Solution of the general *Spaſm;* not the offending Matter or Cauſe of the Diſeaſe thus carried off. When the Matter of the Fever is concocted and aſſimilated, Nature, before under an univerſal *Stricture*, ſuffers now an eaſy Relaxation, and the Fluids from being ſtrongly compreſſed, have room to expand, and occupy a greater Space. The Veſſels thus dilated, the Fluids ruſh, *quâ datâ portâ*, upon this or the other Part, ſo as to occaſion Looſeneſs or moderate Sweats. Theſe may be encouraged with Safety and Relief, becauſe it brings Things again into their natural Channels, and carries off ſuch Recrements as may have been retained during the Courſe of the Fever.

A true practical Theory, founded upon Reaſonings of this Kind, having Nature ſtill for a Rule and Guide, as it gives infinite Pleaſure, ſo it will be of the greateſt Uſe, whatever may be objected to it by thoſe who, from being long accuſtomed to mere Practice and Obſervation, and having ſeen the Falſity and Inſufficiency of general Theories, are, through Careleſneſs or Affectation, fallen into a habitual Contempt and Neglect

glect of all Theory; and, to reduce this to Practice, one Inſtance will be ſufficient to ſhew the Truth of it. If from a ſlight Obſervation, and pre-conceived Notion that ſome fixed unalterable Matter is the Cauſe of a Fever, and that this Matter is not to be overcome but by Nature exerting all her Force to expel it, which, by any Change it may undergo, they do not imagine can be retained, but muſt be diſcharged in ſome ſenſible and plentiful Evacuation for the Preſervation of the Individual. This formal Reaſoning may appear plauſible to ſome, only the leſs thinking I hope; but if from ſuch Reaſoning they ſhall proceed at random in all Caſes, without conſidering the Method of Nature in a Diſeaſe, by warm, forcing, irritating Methods, to ſweat the Patient into Health, and urge her on to effect what in the Courſe of the Diſeaſe was never intended, and juſtify their ſo doing from ſome ſpecial Inſtance or Authority; this would be really to preſume upon the moſt ſlender Evidence, and from ſlight and particular Premiſſes to draw certain and univerſal Conſequences, and eſtabliſh a Rule, which might be extremely hurtful in Practice (*a*). I have

(*a*) One Teſtimony is ſo poſitive upon this Head that it cannot be overlooked: *Tam itaque in hoc quam in aliis mor-*

I have ſaid, that a *Delirium* continues here much longer without ſo much Danger as formerly: For if it continued above four Days obſtinate without ſome Signs of Remiſſion, the Caſe was mortal. We ſhall not be able to account for theſe different Appearances, unleſs we acknowledge ſome Difference in the Cauſes. In long tedious Fevers a *Delirium* will be upon the Patient for many Days, who ſhall notwithſtanding do well. A *Delirium* proceeds from Obſtruction or a Spaſm. That the Membranes of the Brain may be affected with a Spaſm, ſo as to compreſs the Subſtance of it, and bring on a *Delirium*, we need not doubt, when we obſerve what happens in maniac Caſes, where the Patient ſhall be delirious for Weeks or Months, and without any evident Cauſe recover of a ſudden. From a ſudden and violent Paſſion I have known Deafneſs, Blindneſs, and Loſs of Speech, brought on by Turns, and ſometimes Inſenſibility for ſome Days, ſo that an Apoplexy ſeemed unavoidable. This muſt have been altogether from a Spaſm, affecting ſometimes one Senſe, ſometimes another. In many Diſeaſes a *Delirium* is brought on when the Cauſe is very remote from the Brain,

morbis quibuſcunque quos mihi videre contigit, demptâ ſolâ peſte, ſudores prolicere non tam medici quam naturæ provinciæ eſt, Sydenham Tract. de podagra, p. 417.

Brain, which in this Caſe muſt be only ſpaſmodically affected, by mere Conſent, not from any morbid Cauſe exiſting in it. In a feveriſh *Delirium* this Spaſm may ariſe from an acrimonious State of the Juices, affecting the Brain either immediately or remotely, and we can eaſily imagine how Nature may labour under it a long Time, becauſe we ſuppoſe the Fluids not diſpoſed of themſelves to Obſtruction, or to form any mortal *Staſes*; and the *Acrimony*, that occaſions the Fever, *Spaſm* and *Delirium*, may in time be rendred inactive, or waſhed out by plentiful Dilution and continued Drains.

But when a *Delirium* is cauſed by an obſtructing Matter, this Cauſe is ſeated in the Veſſels of the Brain itſelf, as well as its Membranes, and is ſtill more fixed by the general Spaſm, and conſtantly increaſed from a ſizy Blood, till all the Parts within the Brain are overcharged, that they cannot perform their Office; upon which all the Functions muſt ceaſe, and Life at length is deſtroyed.

A ſlow Circulation in the Brain, or ſimply a Tendency to Stagnation, from an effæte State of the Fluids, or a Defect of them, has no ſmall Influence likewiſe to bring on a *Delirium*. When the ſeveral Motions and Secretions in the Brain (upon which all the

the Senſes, both external and internal, depend) are not, for want of a ſufficient *Impetus*, rightly performed, with Conſtancy, Freedom and Regularity, or the Fluids ſtagnating become a Load upon theſe delicate Organs of Senſation, by which their Action is hindred or perverted, in conſequence of which the Faculties muſt neceſſarily ſuffer: This we ſhall find to be often the Caſe in nervous Fevers.——Theſe Diſtinctions (and ſome ſuch were held by ſome of the Ancients (*a*), in the Notions they had of a Frenzy) duly adverted to, give Light into the Subject, and we are made to underſtand in a rational Way what a *Delirium* is, in its Nature, Cauſes, Duration, Periods, and various Appearances; eſpecially if, to complete the Idea of it in all its Circumſtances, we conſider attentively, in viewing theſe Cauſes, the Manner of their acting, and whether they exiſt ſingly or combined. Would it not be ſtill farther of uſe to conſider Drunkenneſs in its Cauſes and Effects, and what Relation it has to this Kind of Fever, and the Symptom now treated of?

Upon the ſame Principles let us endeavour to carry our Reſearches as far as we can with Reaſon and Probability, that we may be able to underſtand the Diſeaſe thoroughly,

(*a*) Cæl. Aurel. præf. lib. 1. morb. acut.

roughly. From the general Cauſes of a *Delirium*, and their Effects upon the Brain, various Diſorders will happen, not very obvious ſometimes, but eaſily ſuppoſable, and that have the greateſt Influence upon Life. A *Lentor* obſtructing, or Spaſm compreſſing the Brain, muſt interrupt the free and equable Circulation in the Veſſels; and hence will ariſe ſlight Tumor of ſome particular Part or Parts, and Inflammation, which will more readily happen if the Humors from Acrimony are apt to cauſe Eroſion; or this Obſtruction and Compreſſion may occaſion a Stagnation of Serum and Lymph in their Veſſels, which, after ſome time, theſe Veſſels being ſtretched and overcharged, will not be eaſily put again into Motion; and if this Cauſe increaſes, an Extravaſation may follow. To ſome ſuch local Affections as theſe, are owing the Deſtruction of ſome Parts as to their Uſe; unaccountable Languiſhing after the Fever ſeems to be terminated, and Returns of Fever in Paroxyſms, or a more continued Form, when the original Cauſes of the Fever and *Delirium*, we have Reaſon to think, are in a good Meaſure ſubdued. I would not imagine Things of this Kind, without being ſupported by Practice, having ſometimes, in the Courſe of the Diſeaſe, met with remote Signs of a Palſy; ſuch

ſuch as Weakneſs and watering of an Eye, with ſlight Inflammation, and imperfect Viſion of it, beſides being ſenſibly retracted; the bliſter'd Parts of that Side not looking ſo florid, nor diſcharging ſo well as the other. If from ſuch Inflammation, or ſtagnating of the Humor, a Suppuration or Tendency to gangrene follows, the Patient, before reſtleſs, begins to have a ſleepy Oppreſſion upon him; he has ſtill ſomething of *Delirium*, but is for moſt part pretty ſenſible. There may be an Increaſe of Fever irregularly, the Urine changes, being by turns pale and highly ſaturated, and ſometimes black almoſt. We are ſtrengthned in this Opinion, if, under theſe Appearances, the original Fever is ceaſed, which we judge of by the Time and other Circumſtances; and it is not an obſcure Sign of the Parts being much leſed, or Humors extravaſated, if Convulſions happen. I do not ſay I was always right in this Diagnoſtic of an Abſceſs and Gangrene, but it gives an Opportunity to recommend a frequent anatomical Inſpection of thoſe who die of Fevers, to aſcertain the Truth of Facts, and enable us to judge when the Diſeaſe is ſimple, when complicated. When the Symptoms of the Fever are overbearing, theſe engage all our Attention, and the Appearances of a local Affection of the

the Brain not being ſuſpected, paſs altogether unobſerved: As in ſome Inſtances we are almoſt ſure of the Thing, methinks we ſhould in all Caſes have a Regard to it, leſt an Effect of the Fever become itſelf the Diſeaſe, and be the Cauſe of Death: Many would have eſcaped a very bad Fever who could not overcome that which is only an Accident of it.

But there are other Conſequences of the Fever, which though not mortal, yet from a *Labes* impreſſed upon the Brain, they lay a Foundation for many After-ills equally troubleſome and hard to remove. If the Veſſels, from a long Stagnation of the Fluids in them, or an increaſed *Impetus* upon ſome of them, are overcharged, and the Membranes are ſtrained by a continued Spaſm, theſe Parts muſt be much weakned, and will be liable upon every Accident to Influxes and Diſtenſions. A Stagnation of Humors and Inflammation may occaſion a thickening of the Coats of the Veſſels and Membranes, and a ſchirrous Diſpoſition of them muſt enſue. If, from great Inanition, the Veſſels ſhould be much exhauſted, ſome of them may collapſe irrecoverably; but this is a ſingular Affection, and requires a ſingular Method of Cure.

It is eaſy to imagine a Number of Ailments

proceeding from ſuch Indiſpoſitions of the Brain and its Membranes; hence will ariſe different Kinds of Head-ach, Giddineſs, Confuſion, Failings, and a long Train of nervous vapouriſh Diſorders, depending upon Cauſes within the Head, which very often are not to be removed till, in a Courſe of Years, the Tone of the Parts, and equable Circulation through all the Veſſels, is fully reſtored. When theſe Cauſes are great, they may impair the Faculties, and ſometimes end in Fatuity. Theſe conſequential Ails are common to all Fevers, but happen moſt frequently in this; it was fit to take notice of them, becauſe Life and Health being ſo much affected by them, we ſhould be always aware of them, and underſtand in what Manner they are cauſed: In this indeed I do not deſire to impoſe my Opinion, for I know every one will reaſon and judge according to his own Apprehenſion of Things.

To prevent therefore, and remove theſe Effects of the Fever, or rather to remedy thoſe Indiſpoſitions of the Fluids that are originally the Cauſes of the Fever, and upon which conſequently theſe Effects depend, ſeems to be a very neceſſary Intention of Cure: In this View it is propoſed, that to all our warming, attenuating, ſtimulating or antiſpaſmodic Remedies, *Cinnabar* be added,

ded, and in no ſmall Quantity; this is not incompatible with the Diſeaſe, nor with any Indication we form to ourſelves in the Cure of it. In a genuine, exquiſite, topical Inflammation, *Mercury*, as a Purge and Attenuant, is beyond every thing. In univerſal Inflammation there is not perhaps, after bleeding, a more powerful Antiphlogiſtic than *Cinnabar*, *Camphire* and *Nitre*. *Cinnabar* is in great Credit with ſome in ſerous and lymphatic Stagnations, not yet *extra vaſa*. In all Diſeaſes from an acrimonious Taint we have Recourſe to ſome Preparation of Mercury as the laſt Reſort, to ſweeten the Humors, or de-obſtruct, and bring them again to a ſound State; but moſt of the Medicines found uſeful in nervous and vapouriſh Ailments are preſcribed familiarly in our Fever, which is a ſtrong Argument for their being the ſame; and if a mild Preparation from Mercury is, upon parallel Indications perhaps, freely uſed in theſe, I cannot ſee a good Reaſon why it may not be uſed in this too.

There is an Objection here that ſhall be allowed to have its Weight in part: Theſe Medicines that can be boldly preſcribed in chronical Caſes, are adviſed with the greateſt Caution in acute, becauſe of their Activity, which joined to the Acuteneſs of the

Diſeaſe, might bring the Patient into greater Danger. To obviate this, beſides what is ſaid of the Uſefulneſs and Inoffenſiveneſs of this Medicine, even in acute Caſes, we ſhould be well informed what Acuteneſs is. Acuteneſs in Fevers, which is only an increaſed Motion of the Blood through the Heart and Arteries, from a particular Cauſe, depends, I ſay, upon the Velocity and *Momentum* of the Blood. The Velocity is according to the Quantity propelled in a given Time through the Heart and Arteries. The *Momentum* is according to the Quantity and Velocity, all which are meaſured by the Strength and Quickneſs of the Pulſe. But in our Fever, though the Velocity is increaſed, the *Momentum* is not increaſed in Proportion, becauſe the Quantity is not increaſed, but *contrà* for moſt part; and therefore the Pulſe is not ſo ſtrong nor frequent as in ſome other Fevers; by which the Degree of Acuteneſs is greatly diminiſhed, and in the Choice of Remedies we are left more at Liberty.

And here it may not be amiſs to take another View of a Fever, as it ſubſiſts in a highly exhauſted State, where the Acuteneſs is not to be determined from the Strength or Frequency of the Pulſe. When from old Age, bad Habit, and languiſhing before, too great

great Fatigue, and ſtarving in the Beginning of the Diſeaſe, and unneceſſary Evacuations, Nature is greatly ſunk, the Pulſe is felt even below the Standard in Health; a Fever in this Caſe is attended with uncommon and threatning Symptoms from Lowneſs. The higheſt Cordial and Strengthner, the *Cortex*, muſt be given upon the ſmalleſt Appearances of Remiſſion, to fetch up from under this ſtrong Depreſſion, leſt the Patient languiſh into inſuperable *Deliquia*, from the Circulation being ſuſpended in the Brain, through a general Defect of the Fluids, and great *Inertia* of the Solids; in ſuch a Caſe I have oftner than once allowed the Patient a Bottle of ſtrong Wine every Day, in one Shape and another, moſtly by itſelf, beſides having proper Food continually poured into him, without which it would have been impoſſible to ſupport him.

The mighty Efficacy of the *Cortex* in the Decline of long nervous Fevers, or after a Remiſſion, is well known to thoſe who have been wiſe enough, by cautious and repeated Trials, to aſſure themſelves of its Uſes and Succeſs, and are thereby become expert in the Uſe of it; they know how much it is to be truſted to, in what Caſes it can be given with Safety, and the Time in which to exhibite it. To ſubdue the Fever, and

prevent the Returns of it, when a few more *Acceſſes* would wear Nature out; to raiſe Nature when the Diſeaſe is much over, and the Patient ready to die of mere Weakneſs; to prevent and remove many Conſequences of the Fever, that, without ſuch Relief, might become fatal, ſuch as Stagnations, partial Inflammation, and Tendency to Gangrene; to anſwer theſe and the like Purpoſes nothing can equal the admirable Virtues of the *Cortex*, which, if we believe thoſe who have had the largeſt Experience of it, is, under proper Circumſtances, a certain Antidote of all Fevers, where the Veſſels are ſtill intire, where there is no Extravaſation, and *Pus* is not already formed.

Formerly I affirmed, contrary to common Practice, that bliſtering in the ordinary Time and Way did harm, or had very little good Effect. I was confirmed in this by the Authority of ſome juſtly reckoned amongſt the firſt in Reputation and Practice, who aſſured me that at that Time they could not obſerve the uſual and deſired Succeſs from bliſtering the more ſenſible Parts: Now I think it has a better Effect, or at leaſt does leſs harm; there does not ſeem to be ſuch a remarkable Tenſion, and conſequently there is leſs Diſpoſition to be irritated. This with me is an Argument that *Acrimony* is chiefly

ly to be accounted the Cauſe of the Diſeaſe, becauſe a *Lentor* in the Blood is more difficultly circulated, and the Arteries muſt exert a ſtronger *Niſus* to make it paſs the extreme Veſſels; hence ariſes a general highly increaſed *Spaſm.* There is as little Ground to think that bliſtering ſhould take place in all Caſes of the Fever, at all Times, and in the ſame Manner, as to believe that there is in Medicine a true *Catholicon;* and they muſt give but ſmall Attention who have not ſeen that what is uſeful in Fevers at one Time may be hurtful at another; it is Practice only can inform us of this; what was meant in a more general Senſe may with ſmall Reſtriction be applied to Fevers in particular: *Sæpe vero etiam nova incidere genera morborum, in quibus nihil adhuc uſus oſtenderit, ut ideo neceſſarium ſit animadvertere unde ea cœperint, ſeu ſine quo nemo mortalium reperire poſſit, cur hoc, quam illo potius utatur* (*a*). That there ſhould be an Alteration in Practice according to the Change of a Diſeaſe, in the different Conſtitutions of it, will be inſiſted on by all who are acquainted with the Hiſtory of Diſeaſes, who know that theſe are not the ſame identically now they were ſome

(*a*) Celſus in præf.

Years ago, or may be but a Seaſon hence; who have obſerved the great Difference there is in Diſeaſes at different Times, both in their Genius and Appearances from the ſmalleſt ſpecific Difference of the Cauſe; and who are not, in ſhort, irretrievably loſt in a *Routine* Practice.

But though bliſtering the Back and Limbs appears to have of late a better Effect, this does not at all ſuperſede the Neceſſity of bliſtering the Head, which to me ſeems ſtill the moſt preferable, wherever the Head is much affected, and the Diſeaſe approaches to Malignity. A *Stimulus* applied ſo near the Origin of the Nerves will procure a great Degree of animal Life, or organical Force. This *Stimulus* will likewiſe confirm the Tone of the Veſſels and Membranes of the Brain, ſo as to prevent their undue Oſcillations and ſpaſtic Motions, and ſecure them againſt Stagnations. This Effect it will have in the Beginning, to prevent, as much as poſſible, a *Delirium*, and may be repeated from time to time to remove it: But the Succeſs of bliſtering will, in a great Meaſure, depend upon the Quantity of the active Salts of the *Cantharides* ſent into the Blood; and this again will be in proportion to the Largeneſs of the Surface to which a Bliſter is applied. There is no equal Surface of any

Part

Part of the Body that can be bliſtered with ſo much Eaſe and Safety as the Head; the volatile active Parts of the *Cantharides* being ſent plentifully into the Blood, will looſen and break down the acrimonious Coheſions, ſcour and ſtimulate the Glands and ſmall Veſſels to a Diſcharge of their foul, heated, ſtagnating Contents, and diſpoſe the whole Body to a freer Perſpiration, by opening the ſeveral Excretories, and preparing the Humours to be excerned; and this in oppoſition to all forced profuſe, and untimely Sweatings, which generally are inconſiſtent with the Genius of the Diſtemper, and not the Method of Nature in it.

In this Species of the Diſeaſe, the low, depreſſing, nervous Symptoms are ſtronger, and the higher Methods of ſtimulating are more neceſſary, and eaſily born. In Raving with a low, intermitting Pulſe, *Subſultus*, Fainting and Coldneſs of the Extremities, beſide frequent bliſtering, we muſt give *Camphire* and *Caſtor*, which are effluent and antiſpaſmodic; and, if the Urine is ſcarce, *Sal Succini*. Small Dozes given frequently anſwer beſt, and the Effect is conſtant. This Method I ſhould have ſaid has hitherto pleaſed me beſt, not having had Courage enough to give greater; though I know the Ancients gave *Caſtor* to two Drachms a Doſe

in

in Fevers. *Galen*, *Aretæus*, *Dioſcorides*, *Pliny*, *Trallian*, *Ægineta*, all ſpeak ſomething of it. Medicine, I believe, has ſuffered no ſmall Loſs through our Ignorance of ſeveral Specificks (ſo called, but which a better Philoſophy pretends now to explain) of the Ancients both as to their Uſe and the Manner of applying them; being now altogether neglected, or under-doſed. The Uſes of *Serpentaria*, *Valerian*, *Aſſafœtida*, *Myrrh*, the *Teſtacea*, are, I ſuppoſe well enough known; and the Forms and Manner in which they may be given. Juleps or Drinks contrived upon the Model of the Ancients, to be taken in Draughts, are wonderfully refreſhing and ſtrengthning to the Sick, for to deal in Spoonfuls is trifling.

Acrid Cataplaſms are of uſe here, which they were not formerly; but muſt be applied with this Caution, that they are to be kept no longer at the Feet than they begin to ſtimulate, and give a right Degree of Heat; When taking them off, lenient Pultices of Bread and Milk and Vinegar are to be applied, eſpecially during the *Exacerbation*, to allay the Heat and Struggle, renewing them alternately, and ſo keeping up a conſtant gentle Heat and *Stimulus*, without increaſing them to Irritation, beyond what the Neceſſities of Nature may require. What the

the juſt Degree here is, few give themſelves the Trouble to think; tho' nothing is more certain, than that Means ought always to be proportioned to the End. But it is not eaſy to judge how far we may go to aſſiſt, without being ſaid to force Nature. If, after Applications of this kind, the Pulſe becomes full and ſtrong, and is not much accelerated, they promiſe to anſwer the End propoſed by them; becauſe we thereby judge that there is yet no great Defect of a Fluid in the Veſſels, and that theſe are not much affected by a Spaſm: But if the Pulſe becomes quick, hard and more contracted, accompanied with ſmart Heat, toſſing and Anxiety, we are to expect no good from ſuch a *Stimulus*.

Diluting Liquors, demulcent and eaſily nouriſhing, are to be given plentifully; theſe are, Almond-emulſion, or fine clear Water-gruel, with a ſmall Proportion of Cream, Decoction of Bread and Currants, with a little Mace, ſmall Sack-whey and Chicken-broth, Sage-tea likewiſe; and to theſe may be added both Juice and Rhind of bitter Oranges, to take off the Inſipidneſs of ſuch Drinks, or any other thing to render them more ſprightly and refreſhing, ſuch as Wine, or ſome cordial Water. At the ſame time, that Drinks are always to be ſuited to the Degree of Heat, Thirſt and Vehemence of the

the Fever; they ſhould, in general, be of kinds leſs diſſipable, that, remaining a longer time in the Veſſels, they may keep up the Fulneſs of them; and mixing intimately with the Acrimony, more effectually retain it, that it may be ſoftned, or carried off in the common Excretions.

In a former Eſſay I endeavoured, from Reaſon and Experience, to juſtify and recommend the Practice of giving Wine in Fevers, and attempted to explain the Operation of it, and ſhew its uſe in the then prevailing kind, from the moſt natural and obvious Principle. I alledged, that by a congenial Heat, or cheriſhing Warmth friendly to Nature, it kindly relaxed the tenſe Fibres and Veſſels, taking off the febrile Stricture, which at that time ſeemed to be a conjunct Cauſe, or chief Symptom of the Fever, and eſſential to it. I ſhould then have added, that this Heat was equally effectual to ſubdue a *Lentor*, and ſo remove all ſlimy mucous, ſizy Indiſpoſition of the Fluids, where there is not already too much preternatural Heat, or Tendency to Inflammation. This Attenuation of a Viſcid in the Blood, by a proper Heat excited in the Veſſels, ſeems to be analogous to what paſſes in Incubation, where, by a moderate, well-proportioned, adventitious Heat, and the gentle Action of the aerial

erial Sac, the *albumen ovi*, which is a tough gellied Liquor, is beat down into a perfect *Liquamen*, fit to be imbibed by the delicate Veſſels of the Yolk or *Placenta*, ſo as to become a proper Nouriſhment for the tender Chick: Or, it may be more groſly repreſented by diſſolving a Gelly with a culinary Heat.

I mentioned likewiſe theſe Virtues of Wine, that render it uſefel in this other Species of the Fever, in which the Blood is ſuppoſed poor and inactive, filled with Acrimony, or too much colliquated. Here it deſerves truly the Character of a high natural Cordial and *Alexipharmic*, and muſt be placed firſt in the Rank of ſafe and effectual Remedies, as certain and agreeable in its Operation, as moſt other things are loathed by the Patient and precarious.

It were to be wiſhed amongſt many other Things, that this Practice of giving Wine in Fevers, could be revived and improved from the Ancients. From many Paſſages of various Authors, we are ſure they had it in uſe. They have indeed with much Caution circumſcribed the uſe of it, being very particular as to the Kind, Quantity and Quality of the Wine; the Diſeaſe, the Times, and other Circumſtances of it, in which Wine was to be given: All which makes me think

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that this Fever was not known to them; for had it been a Diſeaſe of that Day, their Courage and Experience would ſoon have ſuggeſted a more liberal and unreſtrained Uſe of ſuch an apt Remedy, which is altogether ſuited to the Genius of it, and may be given ſometimes in great Quantity and under the worſt Symptoms.

Nor have the Moderns failed in recommending it. It would be endleſs to reckon up all they have ſaid of it; ſome out of fond Prejudice, others indeed with better Reaſon; very few perhaps from a ſolid Trial of it. This, in general, will, I believe, be found a true and wholeſome Obſervation of one of them, *Quotquot modice vino utuntur in febribus, facilius convaleſcunt, vires conſervant, & in priſtinum ocyus reſtituuntur* (a). Another of them goes yet further, and, in oppoſition to *Galen*, who forbids Wine when the Fever is vehement, when there is Headach or *Delirium*, or when the Fever is owing to, or follows Inflammation of any of the *Viſcera*; even in theſe Caſes, he ſays, *Magnâ quantitate ſumptum omnem vehementiam ſedat, nam qualitate narcotica colligit ſenſus, ſomnum conciliat, deliria & dolores acutiſſimos capitis im-*

(a) Helmont de Febr. c. 12.

imminuit, aperit obſtructiones, unde oritur putredo, & concoctionem adjuvat (a). This I can confirm from my own Experience, having given it in high Ravings, Headach, toſſing and watching, and where the Eyes were much inflamed, with wonderful Effect, the Sick having been compoſed by it, and Sleep procured, when Opiates failed, or I durſt not give them. It is not at all doubted that Wine reſembles *Opium* in its Virtues, Operation and Effects, requires the ſame Methods of Cure, when abuſed, and ſupplies the Place of it to thoſe who have diſuſed it: But as a fermented Liquor perhaps it does not, when moderately uſed, leave behind it ſuch a great Depreſſion and Relaxation as *Opium*, rather quickning the Pulſe, which *Opium* renders ſlower. Wine muſt then be uſeful, as it is hypnotic, and a ſafe Anodyne.——— By the agreeable Senſation it gives to the Stomach, it is highly refreſhing, comforts the Bowels, and raiſes the Appetite.——— It affords a fit *Pabulum* to the Blood; filling it with warming ſpirituous Parts, ſtrengthens the Solids, and inſtigates their Motions; in the due Action of which, to keep up a due Force of Circulation, the ſeveral Functions are maintained.

—Gently

(a) Whitakerus Tract. de ſang. uvæ.

—— Gently aſſiſting therefore, and cheriſhing the languid Powers, it promotes all the natural Evacuations, without increaſing the Diſtemper. —— For it is not convertible into the Matter of the Diſeaſe, but, by oppoſite Qualities, reſiſts, or is an Antidote of theſe particular Vices and Corruptions of the Fluids that cauſe the Fever. —— If the Fluids, moving ſlowly, are diſpoſed to ſtagnate and form Obſtructions, by quickning their Motions it will prevent and remove ſuch Stagnations, and ſo becomes a true and effectual Digeſtive; and till a more demonſtrably certain one is diſcovered, I ſhall believe this to be the ſureſt Mean of Concoction. I have tried it much, and with great Freedom, and therefore can ſay it with ſome Aſſurance, that in all great Caſes, Wine, and chiefly Wine, is to be depended upon, when an uſeleſs Heap of nauſeating Medicines muſt be thrown aſide. And here I take the Liberty to tranſcribe a Paſſage from an excellent Author altogether to this Purpoſe, having beſides a Relation to the whole Subject. *Et quidem in febribus malignis vino nil datur excellentius: malignitas dignoſcitur ex motuum & virium defectu; nec non valde depreſſa ſanguinis ſpirituaſcentia, ex tardo circulo ejuſdem, quæ cuncta diſpoſitionem quandam cruoris ad putredinem de-*

deſignant, igitur in iis morbis reſtaurare vires, ſpiritus erigere, circulum ſanguinis liberum reddere, tranſpirationem movere expedit; & in eo verſatur omnis alexipharmacorum virtus: quod autem vinum hæc omnia præſtet, nolumus pluribus authoritatibus, quibus practicorum libri ſunt pleni, confirmare ſed confugimus ad ſolam experientiam, quâ nobis conſtat, plures ex malignis evaſiſſe ſolius vini moderato uſu (a).

It muſt not be imagined that I am here contending for an unlimited Uſe of Wine in Fevers. There are Conſtitutions both of the Diſeaſe and the Patient, where it is plainly forbidden. But whatever Inconveniency may attend the Uſe of it, it carries this Advantage along with it, that it very ſoon ſhews its Diſagreement, by the immediate Diſorder it cauſes, which is an early Caution to deſiſt from it; and there can be but ſmall Hazard in making an Experiment. In adviſing it therefore I am guided by a very plain Rule. If it does not give Uneaſineſs to the Stomach; if it does not raiſe Heat and Thirſt, with an Increaſe of the Fever, Reſtleſſneſs and Raving; much more if the Sick are refreſhed, compoſed, and inclined

(a) Frid Hoffman. diſſert. phyſ. med. IX.

to Sleep by it, have greater Freedom from their Sickneſs, or are better ſupported under it, I preſently conclude it to be a ſafe and ſuitable Remedy, that it muſt do good; and without Fear enjoin the Continuance of it, in ſuch Quantity, Time and Manner as the Diſeaſe ſeems to require, and the Sick can bear. Nor is the Choice of Wine an indifferent Matter, even in thoſe Conſtitutions that will admit the Uſe of it. In moſt Caſes I have uſed Canary; which anſwers beſt where a *Lentor* in any Degree is ſuppoſed to prevail, and accompanied with Tenſion. But there are ſome, eſpecially in long Fevers, who, from a ſmall Quantity, are much heated and ruffled; ſuch will agree better with a ſtrong, old, ſound Claret, and bear it in good Quantity; for by ſtrengthning remarkably the Tone of the Veſſels, it is uſeful to repreſs all ſudden Rarefaction or Agitations the Fluids are diſpoſed to; and, by ſtoring the Blood with auſtere and reſtrictive Parts, hinders a further Colliquation of it.

When we obſerve the little Succeſs that ſo often attends the common Methods of Cure in Fevers, we naturally wiſh for, and are led to enquire after ſome other and more certain Method. He at leaſt who is anxious for his Patient, and wiſhes the Advancement of his Art, will do ſo. *Bathing* the whole Body

Body, or the largeſt Surfaces of it, preſents itſelf to us with conſiderable Advantages. When the Blood-globules are heated, and ſo may become too fierce, leſs fluxile, or eaſily diſpoſed to Rarefaction: When, with reſpect to the red Globules, there may be a Redundancy of Acrimonious *Serum* in its Veſſels, and ſtagnating Lymph in the Glands: When the remote Veſſels, from their natural *inertia*, or being over-charged, are not able to puſh on their Contents: When the Veſſels are rigid from a Spaſm, or parched and collapſed through Heat and Inanition: And to one or more of theſe Circumſtances (in which the Malignity conſiſts) a general Defect of the Fluids is joined: When this is the Caſe, I ſay, a ſpeedy and powerful Remedy is required, that the Patient may not be left to the tedious and uncertain Event of Coction, which, for moſt part, is attended with certain Danger. A *Bath* applied to the whole Body, acts immediately upon all the Veſſels, and the Virtues of it are as inſtantly communicated to the whole Maſs, by the numerous bibulous Veins upon the Surface; and, at once, as it were, the Solids are relaxed, the Veſſels are filled, the Body is nouriſhed, the Blood is cooled, the Fluids are attempered, and a due Degree of Warmth and Motion imparted. And hence, if any

thing can poſſibly effect it, there muſt neceſſarily enſue a ſudden and total Change of Cauſes and Accidents; while ſuch Cauſes do not exceed, but ſtill obtain the proper Conditions to be acted upon, according to the ſtrict Laws of Mechaniſm and the Oeconomy. Theſe Ends are anſwered in this way, more certainly and expeditiouſly, than by the moſt methodical Courſe of Medicines, often inſignificant in themſelves, and given in as trifling Doſes, which cannot produce their Effect, till they have gone the long Round of Circulation; and what Changes they may undergo we know not. We attempt ſomething of what is here propoſed, by theſe partial Bathings that are in uſe; and when we make Applications to different and more ſenſible Parts of the Body, under the ſounding Names of *Frontalia*, *Suppedalia*, &c. And we have obſerved no ſmall Benefit even from theſe. But this Relief is greatly diſproportioned; and I do not ſee the Hazard of carrying the Thing a much greater Length; for by doing what we do, we acknowledge the Reaſonableneſs and Neceſſity of doing much more.

Facts, and the Reaſon of the thing are ſtrong enough to overcome the graver Arguments brought againſt the Method here recommended: At leaſt our Experience of

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it is ſo ſmall, that it cannot thence be determined what the real Danger of it is; which is the only Objection that in Juſtice ought to be made to it: Yet becauſe of a common Miſtake and groundleſs Averſion, we continue ſtill to be deprived of one of the nobleſt Aſſiſtances Nature has yet afforded, or ſhall ever perhaps be in the Power of Art to invent. Bathing of all kinds obtains now in a long Tribe of chronical Ills, why not in acute ones too, Regard being had to the Diſeaſe, Climate, Manner of Bathing, Condition of the Sick, and other Circumſtances? The ſeeming Severity or Indelicacy of a Method ſhould not, when Life is at Stake, deter us from it; nor, while this remains untried, has the deſpairing Patient been allowed every fair Chance for Life.

The Opinion of the Ancients as to Bathing, is clear and expreſs; and their Example, to whoſe Honeſty and Induſtry we are ſo much obliged, ſhould not a little determine our Practice in this Matter. To quote one of them ſhall at preſent ſuffice: *Cum itaque ſola febris conſtiterit, balneum expoſcit, non ſecus ac cæteræ ſiccitates, quæcunque vel calidæ fuerint, vel frigidæ* (a). And in many other Places he ſpeaks

(a) Galen libro de Maraſmo.

ſpeaks to the ſame Purpoſe. We may be taught the thing even from the more barbarous Nations, who plunge their Sick into cold Water, or wrap them in Snow, and thus preſerve them, being unacquainted with a more refined and delicate Practice, and I believe a more ineffectual too. It has been known likewiſe to check, and effectually remove the higher Symptoms of Malignity, ſuch as Spots and Hæmorrhage. The irrational Creatures, wiſely guided by Inſtinct, have Recourſe in their Heats and Diſeaſes, to Bathings. Referable to this Head are many Irregularities committed by the poorer ſort in their Illneſſes, which we think very hurtful, and often wonder they are not killed by them. But if we conſider things well, we ſhall find that what they do, tho' it may have bad enough Conſequences ſometimes, is in the main right, and perfectly agreeable to a ſound Philoſophy: For the Diſeaſe is frequently cured by what we reckoned a dangerous Trangreſſion. It is from our Obſervations upon the Poor, and moſt uncultivated of Mankind, and Brute Animals, aſſiſted by ſome Chance-diſcoveries in Medicine, that we muſt frame a true Syſtem, founded in, and conſonant to Nature, and purged of all learned Uncertainties, and perverſe Notions of Science; as well as of ma-

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ny impoſing Delicacies, Devices of Craft, and the Impertinence of Faſhion. A great many Reaſons and Authorities might be adduced in favour of what I have ſaid; but I do not pretend to inforce any further a Practice ſo much ſuſpected, perhaps abhorred. If ever it ſhould come into Credit, a good deal of Judgment will be required in the Contrivance of Baths, which muſt be ſuited to the Nature and Degree of the Fever. They would conſiſt chiefly of Water, warm or cold, ſimple or medicated; Broths, Milk, Vinegar, by themſelves or compounded.

Thus, Sir, I have, without Reſerve, given you my Sentiments concerning theſe Matters. I need not attempt to perſwade you who know me, that neither Fondneſs for my own Opinions, affecting to differ from others, or Deſire to appear ſingular in my Opinion, were my Motives in writing. If it could at all profit the Subject, or oblige thoſe whom I am always ready to pleaſe, I was willing to offer a few Hints, (founded I am certain, as to the practical Part, upon Obſervation, and agreeable, I hope, in Theory, to the Nature of things) which better Judges might poſſibly improve, to the further Advancement of the healing Art.

XLIX. *Anomalous Agues cured by Mr.* DUNCAN BAINE *Surgeon in* Pembroke.

THE intermittent Fevers have of late Years appeared frequently in very irgular Shapes, when the common Method of Cure cannot be followed, and often the poor Patients are thrown into violent Disorders, when that common Method is used, and the Ague is attempted to be put away, before sufficient Evacuations have been made. You have recorded in your Volumes already published several Histories of this Kind; but believing that some more Examples of the Cure of anomalous Agues, where successful Cures were made by different Methods, would not be unacceptable to you, I send you the two following Cases.

John Rhenish, a Farmer's Son about 26 Years of Age, of a strong plethorick Habit of Body, who had laboured under an Ague half a Year, for which he had taken a great deal of the *Cortex*, and other usual Medicines, asked my Advice 30th *August* 1736. While I was discoursing with him, and enquiring into his Case, he was suddenly taken

ken with a violent ſtamping of his Feet, and the Convulſions gradually aſcended from the Soles of his Feet to his Legs, Thighs, Belly, Back and Shoulders; after which his Head was moſt violently convulſed with a total Deprivation of Speech, but he had a moſt diſmal Vociferation, that might have been heard at a great Diſtance, his *Abdomen* and *Thorax* working and heaving violently and unuſually in the mean time. This Fit having laſted half an Hour, a total profuſe Sweat broke out, which relieved him, and he could then anſwer the Queſtions I put to him. He told me that he had ſeveral ſuch Fits of late, which made his Neighbour conclude him bewitched, that he imputed them to a Fright he had got in this Month of *Auguſt*; for ſleeping on the Graſs, when he awak'd he ſaw a large Adder coming towards his Face, and getting ſpeedily up in a Fright went home, and was immediately ſeized with one of theſe Fits, which had returned ſometimes twice a Day at the ſame Time when his Ague uſed to return. During the Paroxyſm his Pulſe was very high and quick, his Face much inflamed, and his Eyes ready to ſtart out of his Head. After the Fit was over he complained of a moſt torturing Pain of the Bowels, his Tongue was generally moiſt, and he had a Suppreſſion of Urine. That

That Afternoon I gave him *Sal. vitriol* Drachm. i. *Oxymel ſcillit* Unc. 1. which operated very moderately. Next Day he took a ſtrong Doſe of *Tinctura ſacra*, with ſome Drops of *Sp. lavendul.* and an Ounce of *Syrup. de Rhamno*, which purged him well, and his Paroxyſm returned an Hour later than the Day before.

September 1ſt, I ordered ten Ounces of Blood to be taken at his Arm, and gave him frequently ſome Spoonfuls of a Julep compoſed of *Aq. Roriſmarin. Salv. Rut. Lavendul. ſimpl. Aq. Pæon. Bryon. comp. Sp. Lavendul. Sal. volatil. oleoſ.* and *Viſc. Quercin.* in which he alſo ſwallowed a *Scruple* of *Pulv. de Gutteta* in the Morning, Afternoon and at Night. The Blood being very ſizy I ordered him to be again blooded next Day, and at Night gave him the *Pilul. anticolic.* at Bed-time, which operated very well towards the Morning, and that Day he eſcaped the Fit. At Night I gave him the following Bolus, ℞. *Pulv. antepilept. alter. Quincy*, Scrup. ii. *Cort. Peruvian.* Drachm. 1. *Sal. abſinth.* Gr. x. *Laudan. liquid. Sydenham.* Gutt. xx. *Syrup. Pæon. q. s. ut f. Bol.*

Sept. 4th, He began to uſe this Electuary: ℞. *Pulv. antepilept. alter.* Drachm. ii. *Cort. Peruvian.* Drachm. vi. *Sal. abſinth.*

Drachm.

Drachm. ſem. *Syrup. Pæon. q. s. m. f. Electuar. cujus cap. molem. n. m. tertiâ quâque horâ ſuperbibendo cochlearia quatuor julep. priùs præſcript.* His *Quotidian* Fits changed into *Tertian*, and were not near ſo violent.

Sept. 8th, He took a Vomit of *Ipecacuanna*, which vomited him well enough; but, not having purged him, I ordered a Clyſter at Night, and after it gave him an Anodyne of *Philon. roman.* which always gave him great Relief from thoſe Pains of his Bowels which came after every Fit.

Sept. 9th and 10th, he continued the Uſe of the *Electuary* and *Julep* laſt preſcribed.

Being ſtill much troubled in his Bowels, and ſometimes convulſed, I gave him a *Scruple* of *Calomel* on the Evening of the 11th, and purged it off next Morning, quieting all at Night with the *Philon. roman.*

13th, 14th, 15th, he took the *Electuary* and *Julep.*

16th, 17th, 18th, 19th, he uſed the following Infuſion: ℞. *Pulv. cortic. Peruvian.* Unc. 1. *Sal. abſinth.* Drachm. ii. *coq. ex aq. font. lib.* iv. *ad lib.* ii. *colatur. affund. rad. gentian. galang. zedoar. calam. aromat. ſerpent. virg. à* Drachm. 1. ſem. *Cort. aurant. ſicc.* Unc. ſem. *Summit abſinth. roman.* Drachm. 1. *Centaur. min.*

Scrup.

Scrup. ii. *leni calore adhibito infund. per aliquot horas dein colaturæ adde Aq. theriacal. epidemic. à* Unc. ii. *Vin. chalybeat.* Unc. iii. *Sp. lavend. comp.* Unc. ſem. *m. cap. cochlearia ſex tertiâ quâque horâ abſente paroxyſmo.*

Sept. 20th, The *Calomel* with the Purgative and *Philonium* next Day were repeated.

24th, The Infuſion was given, and now being much better, he went home the 25th; but his Fits returning, I ſent him eight Grains of *emetic Tartar*, and a little after he took a Vomit of *Turbeth mineral*, after which he had no more Fits; but I made him continue in the Uſe of an Electuary compoſed of *Pulv. cortic. Peruvian. Viſc. quercin. Sal. abſinth.* and *Elixir. vitriol.* by which he recovered.

II. A Gentlewoman, aged 30, who lived in low fenny Grounds, where ſhe and all her Family were frequently ſubject to *Agues*, was delivered by me here about ſix Weeks ago of a Son; the Labour being hard and difficult, ſome Days after ſhe complained of a Pain on the *Os iſchium*, which removed down to the Middle of the *vaſtus externus* Muſcle, and came every Day at a certain Hour, throwing her into a violent Fever, which terminated in a Sweat, after which ſhe became eaſy, eat and drank as uſual. I

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gave her a *Vomit* and Purgatives, and then preſcribed the *Bark*, *Elixir. vitriol.* and *antiſpaſmodic* Medicines, and applied a large Bliſtering-plaiſter to the pained Parts; by the Uſe of which ſhe is recovered.

L. *Remarks on the Management of the* Small Pox, *by Dr.* THOMAS SIMSON *Profeſſor of Medicine in the Univerſity of* St. Andrews.

AS I have obſerved often to you in general concerning *acute Diſeaſes*, ſo I muſt now in particular as to the *Small Pox*, that nothing requires more Attention and Judgment while they run their natural Courſe, ſo various in different Perſons, than to determine what the Phyſician's Preſcriptions contribute to the Changes they undergo. Since *Sydenham*'s Time ſeveral Improvements have been made in the Management; but yet notwithſtanding all that *Sydenham* advanced, and the lateſt Improvements, Practitioners are far from having agreed in the Method of Cure; and I myſelf, though initiated into *Sydenham*'s Practice, of which in moſt Diſeaſes I have been a great Admirer, found a Neceſſity to break off from him

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in the *Small Pox*; but not for what he was moſt conſpicuous, and had the greateſt Oppoſition, as he ſtill has, the *cool Diet*, but for that Piece of Management wherein he and his greateſt Adverſaries ſeem to agree, the keeping the Patient conſtipated through the whole Time of the Suppuration; and the ſupporting the ſwelling of Head and Hands, *&c.* by a conſtant Uſe of the *Syrup of white Poppy*.

I am much ſurpriſed that ſuch an attentive Phyſician as *Sydenham* could ſee ſo many Patients monſtrouſly ſwelled, dying delirious with *Angina* and *Peripneumony*, as moſt of them die after the Height, without ſuſpecting the damming up of the Liquors in time of the Suppuration as the great Cauſe of it. True it is, that in the very worſt Kinds before the Height they die, with a moderate Swelling only, and often with a very ſmall Degree of a Fever, as in theſe Fevers which have got the Name of *nervous*; but this, in my Opinion, was ſo far from ariſing from the Liquors being too little puſhed towards the Surface, that it aroſe wholly from the Precipitancy of the Run that Way, by which the Circulation was quite ſuffocated in the Capillary Arteries, and no Acceſs allowed to the ſerous Veſſels; hence Gangrenes, *&c.* the ordinary

ry Concomitants of ſuch Inſtances; and conſequently the more in them we puſh the Fluids to the Surface, to which they naturally flow in this Diſeaſe, we haſten the bad Symptoms, as we likewiſe do in the more moderate Caſe, where the ſerous Veſſels get Supplies, but ſo largely as to compreſs the Parts about, and deſtroy their Action. In both which Caſes it is evident, that nothing ſhould do more Service than the Subſtraction of ſome of that Matter with which theſe Veſſels are deſtroyed or overloaded; for which Purpoſe I know nothing ſo ſerviceable as moderate purging, which in all other inflammatory Caſes, where we fear too great a Diſpoſition to Suppuration and Gangrene, we always fly to as ſoon as poſſible, this carrying off a greater Proportion of the vitiated *Serum* than the good Blood, and being carried on with leſs Diſturbance to the Body than Salivation can be.

But this much for *Theory*, which I truſt little in ſuch Diſeaſes: I muſt now inform you, that finding under a ſevere *epidemical Small Pox* raging here in the Year 1729, that ſome of the Patients under my Care, after the Suppuration, with which they ſeem'd at firſt to be eaſed of the ſevereſt Symptoms attending the Eruption, fell a raving again, upon which I immediately ſuſpected

ſpected the Syrup as the natural Cauſe of it, and ſuſpended its Uſe, which hitherto I had followed out in *Sydenham*'s Method, and diſtinctly found that my Patients with dangerous Symptoms were always more free of raving and Fever when not uſing it, and ever ſince that Time I never propoſed it, except when a great Pain or Reſtleſneſs accompanied the Suppuration, in which Circumſtances I have found it a charming Medicine. In this Situation then I began to examine the whole of *Sydenham*'s Method with ſomething of more Attention, and to conſider what the Uſe of the Syrup, ſo much inſiſted upon in that Diſeaſe, could be, and with what Intention it was given.

I found evidently, by *Sydenham*'s Expreſſions in his Letter to Dr. *Cole*, that his Intention was to keep down the *inflammatory Emotions* and *ſecondary Fever*, and for this End he made uſe of it once, twice, and ſometimes thrice a Day, not only through the whole Time of the Suppuration, but long after it. How ill this paſſed with me may eaſily be gueſſed from the Obſervations I had made in this Diſeaſe of late, which had ſatisfied me, that for certain here, as we find in other inflammatory Diſeaſes, it raiſed both Fever, and, one of its worſt Symptoms, the *Delirium*. This I became convinced

vinced of when I found in *Sydenham*'s own Practice, that he was obliged to call in another Help againſt theſe feveriſh Emotions, particulary the *ſecondary Fever*, to wit, that of eaſy purging, though he did this ſeemingly againſt the Indications he had formed for his Management of the Diſeaſe in general, as we ſee by his Expreſſion, where he pleads for it in his *Schedula monitoria*, there he calls it a *Cuneus durus duro nodo*, though I would have reckoned, by the Way he introduces this, that he had ſuſpected the bad Effects of the Syrup, ſo far as to have been a juſt Reaſon for the more moderate Uſe of it in the firſt Steps of the Diſeaſe: *Cum verò*, ſays he, *ultimis morbi diebus haud rarò accidit, ægri alvum, partim à morbi natura, partim à magna paregoricorum vi, quorum opem planè deposcebat medendi ratio, ita conſtipatam eſſe, ut tum fere ſuffocetur ille, tum febris ad eum gradum aſcenderit, ut jam de ægro penè conclamatum videatur.* So that his liberal Uſe of it was ſo far from quieting theſe feveriſh Fits, that he acknowledges it as ſharing in the Cauſe of them, as was moſt natural, conſidering the native Effects of this Syrup: I muſt then ask why ſuch a conſtant Uſe of it through the Riſe of the Diſeaſe, as he ſeems to have made,

and as over all *Britain* his Followers ſtill continue to make? After all the Obſervation I could make theſe Dozen of Years bygone, I can find no Good to attribute to it, but what is another native Effect of it, the eaſing of Pains. I have ſeen Children toſſing with theſe in a moſt diſmal Manner, tearing their Fleſh with their Nails, eaſed as by a Charm by two or three Tea-ſpoonfuls of it, and after that go through their Courſe perfectly eaſy, and getting timeous Reſt; ſo that nothing could be more deſirable than its Effects. But becauſe when given in ſuch Straits with Succeſs, ſhall we loſe the View for which it was certainly at firſt given, and give it in all Circumſtances contrary to the moſt plain Indications? What more juſt and natural in a Diſeaſe abounding with putrid Matter, than gradually to make a Subſtraction of it, and to keep an open Belly rather than dam up the whole Secretions, the native Effect of this Syrup? But it may perhaps be replied, that by this means the Hands, Face, and the Puſtules themſelves, would be made to ſubſide before the Blood was duly purged from the Infection: This, I ſuſpect, has been the Reaſon why Evacuations of all Things have been ſo much objected againſt in the Riſe of the *Small Pox*, it being judged that the ſuppurated Matter was

caſt

caſt out from the Maſs, and that the Matter which ſwelled Face and Hands ſupplied or ſupported it; but I look upon all theſe as indigeſted Notions, which have ſerved for nothing but to eſtabliſh a very bad Practice, the *Small Pox* being indiſputably a Diſeaſe of the Skin, which firſt inflames and then ſuppurates, to accompliſh which nothing can contribute more than a free Circulation about the external Parts of the Body, which the Swelling going beyond Bounds very much impedes; ſo that the Increaſe of the Swelling and Puſtules themſelves ſhould be look'd upon as two very different Things; theſe cannot riſe too much, but the other, as I have often obſerved, when exceeding, is the Introduction to the very worſt Conſequences of this Diſeaſe, as I have ſeen it in Caſes where the Puſtules themſelves were few, and of a juſt Magnitude; and what can we expect when the Body is all over œdematous with a Fever, but *Deliriums*, *Peripneumonies*, Extravaſations of Blood, *&c.*?

To evite theſe was the View with which I firſt became ſparing in the Uſe of the *white Poppies*, and which ſince has made me venture, through the whole Time of Suppuration, to procure to my Patients the ordinary Courſe of their Belly at leaſt, and, I muſt

inform you, with moſt agreeable Succeſs; for I never find the *Small Pox* keep up better, and the Patient eaſier, than under this Regimen: So that I had between three and four Dozen this ſame Year, moſt of which were of the coherent Kind, and ſome confluent, few of which had ſo much as the Appearance of a Fever upon the Turn of the Diſeaſe; they drank ſmall Beer and Whey, and eat boiled Prunes at Pleaſure. In the mean time, in ſmall Fiſher-towns under no Phyſician's Care, I have known eighteen or twenty die of the ſame Small Pox, where ſcarce twice that Number had been infected, which in all their Symptoms agreed much with what the diligent Dr. *Huxham* deſcribes as raging at *Plymouth* in the Year 1724 and 1725, (*Philoſophical Tranſactions*, No. 390.) and what Surpriſe is it that they ſhould make ſo much Havock, when perhaps, from the Beginning to the End of the Diſeaſe, the Patient is not allowed one Stool! boiled Milk and Water, Groat-broath and Syrup making up their Management; for every Nurſe through the Country knows the Uſe of it. To Infants this Management muſt be ſtill more fatal, for they at no Time can be eaſy under Conſtipation, and yet theſe are handled the ſame Way. I have found them five or ſix times a Day at Stool with

with the beſt Effects, nor did I ever ſee a ſudden collapſing of the ſwelled Parts by inſiſting on this Method; I mean, by keeping up the natural Courſe of their Belly, or even making them more open, when an exceſſive Swelling calls for it, under which, as Dr. *Mead* obſerves in his Letter to Dr. *Friend*, you will often find them expiring; and therefore I have always made it one Part of my Management, even under the Riſe of the *Small Pox*, and Suppuration, to keep it at under; and *Sydenham* allows, in his Hiſtory of the regular Small Pox, that the open Belly at theſe Times is the only Thing that ſaves Children, as Salivation does the elder Patients. What can we conclude from this, but that ſome Evacuation of the *Serum* under theſe Swellings is neceſſary, and that we are pleaſed when it happens of itſelf; but why not imitate Nature, and carry on her Work when too tardy? You agree, but ſay the ſame Outlets which Nature chooſes are to be ſought after by us. I demand what makes one Evacuation ſerviceable to one, and not to another? Nothing, in my Opinion, but becauſe in theſe differet Subjects the Acceſs of ſerous Liquors is different. In the younger, much given to purging, when the Veſſels are loaded, the Liquors readily break out by the Inteſtines;

in the elder, when they cannot make their Way downward, they ſhow their Force at the ſalival Glands, but with a great deal more Hazard, becauſe this cannot happen till all the Parts about are over-diſtended, though ſometimes the Guts yield; but then our Prejudices againſt their Service is ſo great, that we do all to divert this Evacuation upon the firſt Appearance, though, if it were more favoured, I doubt not but we ſhould frequently ſee the good Effects of it; and this not only from what I have found by forcing moderately this Evacuation, but from a general Obſervation of Dr. *Wintringham*'s concerning it, when happening naturally, who, in the 63d Page of his *Commentarium Noſologicum*, has this juſt Remark, *Jure quidem horrent medici Diarhæam vires proſternentem, ptyaliſmum ſiſtentem, faciei & extremorum tumefactionem impedientem: hunc verò effectum à tali alvi ſolutione ortum, me nunquam obſervâſſe memini, ſed è contrà, juvenibus ſanguinolentis, ætate & viribus florentibus, hanc praxin ſæpe utilem novi.*

This is moſt agreeable to what the long experienced Phyſician *Hoffman* obſerves in his Hiſtory of the epidemical Small Pox 1698, in which he ſays, *Diarrhæas ſiſtere periculoſum fuit*; and in his third general

neral Rule, for Practice in this Diſeaſe, he obſerves, *Frequens juvenili imprimis ætati ſymptoma eſt ſalivæ fluxus, qui ſuppurationis tempore ut plurimum effuſior accidens, non modo hanc, ſed & ſomnum non ſine periculo impedit. Moderandus igitur tam per alvi ſolutionem mediante clyſtere emolliente, quam*, &c. And who would not ſuſpect Hazard under ſuch terrible Swellings as happens in this Diſeaſe, upon the riſing of a Fever, with which it is often accompanied at the Turn of the Diſeaſe?

I hope then what I have advanced ſhall bring Practitioners to enlarge their Views, and not out of a raſh Proſpect of keeping up the Puſtules and Swelling, ſtifle their Patients. The Diſeaſe, at the Time the Surface of the Body inflames and ſuppurates, abounds in a ſuperfluous *Serum*, which rather impedes than advances the Suppuration, and which, dammed up in the ſerous Veſſels, heightens all the bad Symptoms in the Turn of the Diſeaſe; whereas by keeping the Body moderately open, by Prunes, Cow-whey, Clyſters and the ſofter Drinks, all the Paſſages for the Secretions are kept open, and ready to help at this Period, and that without diſturbing the Small Pox themſelves, as a Dozen of Years conſtant Practice has now confirmed to me; and therefore I muſt re-

commend this Method to this Part of the Country, who ſeem ſtrangely prejudiced againſt it, and ſeldom allow the Diſeaſe to take a Courſe downwards, which oft it would do if left to itſelf: Not that I neglect the Syrup of Poppies, but when I uſe it for giving Reſt and eaſing Pain, I am always ſure at the ſame time to give a Clyſter, which makes it much more ſucceſsful, and by this Means I ſee what its Service is; whereas in uſing it as *Sydenham* did, it is hard to tell what we deſign by it; it is uſed as a Specifick, at the Time all its Effects are contrary to what we ſeek for, the freeing our Patients from a Load of putrid Humors. But this I reckon ſufficient for an Advertiſement to make the Phyſician who wiſhes well to his Patient examine the Courſe he fixes in.

LI. *A Hiſtory of the* Rabies canina, *by Dr.* Andrew Plummer *Profeſſor of Medicine in the Univerſity of* Edinburgh.

A Young Gentleman about 17 Years of Age, who had been Apprentice to a Surgeon in the Country, and had come to *Edinburgh* for his Improvement, about the Beginning of *December* 1728 was bit by a Dog

Dog in the middle Finger of the right Hand, about the Middle of the Nail. At firſt he ſaid the Dog belonged to a Perſon of his Acquaintance, which Dog had no Symptoms of Madneſs at the Time; but afterwards he affirmed that he was bit by a ſmall Dog which he obſerved ſtraggling on the Streets, when he was endeavouring to catch him, and that he never knew what became of the Dog. The Wound gave him very little Trouble at firſt, and he ſoon cured it in the ordinary Way.

In the Beginning of *January* 1729 he firſt complained of Pain in that Finger, reaching along the Back of the Hand to the Elbow, accompanied with a Numneſs of the Finger. In the Night betwixt the 6th and 7th of *January* he was very hot and reſtleſs, the Pain ſtill increaſing, ſo that next Morning he went to Dr. *Charles Alſton* to ask his Advice; he ſhewed him his Hand, and told him that he had been bit by a Dog ſome Weeks before, but that the Dog was ſtill alive and well. The Doctor adviſed him to uſe an emollient and anodyne Fomentation, and a cooling Diet. Accordingly he fomented his Hand for ſome time that Evening, and having taken ſome light Slap for Supper, went to Bed; but the Sharpneſs of the Pain made him toſs all Night, and put him

in

in a great Heat and Sweat. Being very thirſty, he roſe in the Middle of the Night to get ſome Water or ſmall Beer to quench his Thirſt. When he got the Liquor he found that he could not drink ſo much as he inclined, becauſe of ſome Difficulty of ſwallowing. In the Morning he attempted again to drink, but the Liquor had ſcarce reached his Throat when he was ſuddenly convulſed, let fall the Cup, and ſaid to his Comrade that he was almoſt choak'd. Some Hours after, when he was getting out of Bed, he ſtaggered, and complained of Giddineſs of his Head and Sickneſs at his Stomach, and intreated his Comrade to bring Dr. *Alſton* to viſit him. The Doctor having heard his Complaints, and finding him ſtill hot and feveriſh, and his Hand much pained, ordered him to be blooded immediately, and to have a purgative Ptiſan given him as ſoon as poſſible. After letting ten Ounces of Blood the Pain of his Finger abated, and he found himſelf eaſier; when the Ptiſan was brought he made many Excuſes to ſhift the taking of it; but at the Intreaty of his Friends he made ſome Attempts, and declared he could not ſwallow it. In the Evening he was perſwaded to try if he could get over a little ſoft Bread ſoak'd in Sack-whey; he took it into his Mouth, rolled it about

about for ſome time, but when he was about to ſwallow it he ſpit it out ſuddenly, and with a convulſive Motion; however that Night he ſlept pretty calmly, and had a moderate Sweat upon him. Next Morning he appeared ſomewhat diſordered, ſpoke incoherently, fetched deep Sighs, complained he could not breathe, and that ſomething interrupted the Motion of his Heart. About eleven in the Forenoon Dr. *Alſton* came to viſit him, he found him very uneaſy, toſſing his Head, and ſhifting Poſtures; he obſerved that his Mouth was frequently diſtorted, and other Muſcles of his Face convulſed; his breathing quick, and his Pulſe frequent but feeble: He asked him to take a little of a Cordial which was at Hand, he ſaid he durſt not attempt to ſwallow, for it would choak him; but being preſt to try it, he put the Glaſs to his Mouth, and poured in the Liquor ſuddenly, but he as quickly threw it out again, with a kind of Horror and ſhivering. The Doctor perceiving theſe extraordinary Symptoms, and apprehending the Lad to be in the greateſt Danger, went to the Elaboratory about twelve o' Clock, where he expected to meet with ſome of his Collegues the Profeſſors of Phyſick, and carried Dr. *Rutherford*, Dr. *St. Clare* and me along with him to his Patient, and at the

the ſame time ſent to Mr. *Monro* to meet us there. We found him very much diſordered, like one in an Agony, toſſing his Head and his Arms. His Face was red and blotted, his Eyes wild and ſtaring, conſtantly ſquirting out his Spittle; ſometimes ſtarting up ſuddenly from his Seat, then throwing himſelf down upon the Bed; yet he anſwered Queſtions that were put to him pretty compoſedly; only he would now and then ſtop ſhort of a ſudden, and beg that ſuch a Perſon, who was his moſt intimate Friend and Comrade, might not be admitted into the Room, for he could not bear the Sight of him, nor hear his Name mentioned, but could give no Reaſon for it. He was deſired to ſip a little Liquor out of a Tea-pot, he attempted it with great Reluctancy, but ſpit it out immediately, appearing to be in the greateſt Diſorder, complaining that his Breath was quite ſtopt. The Phyſicians retired to a Coffee-houſe to conſult if any thing could be attempted with any Probability of Succeſs, and carried along with them the young Man who had been the Patient's Bed-fellow and moſt intimate Companion, that they might be better informed of all that had happened to him; he aſſured them, that though he had told Dr. *Alſton* that his Finger was bit by a Dog be-

belonging to a Friend, which was then well, without any Symptoms of the *Rabies*, yet when he returned home immediately after the Bite, he ſaid it was given by a Dog ſtraggling in the Streets with a Collar about its Neck, and that he never ſaw the Dog more. He informed them likewiſe, that the unhappy Lad, at the Time he was bitten, had a Gonorrhœa, for which he had been taking Medicines privately; that his Method was to take a Doſe of *Mercurius dulcis* at Night, and early next Morning ſome Purgative, the Operation of which was generally over about Mid-day; after which he uſed to attend his Profeſſors, and go about any other Buſineſs. The Phyſicians had not ſit long, when another young Man, a Comrade of the Patient, came in, telling them, that ſoon after their Departure he found himſelf much worſe, and believed he was a-dying, and therefore entreated him to call back the Phyſicians; but as he was going out the Patient run after him, and fell upon him in a moſt outragious manner, and would have done him a Miſchief, if the People of the Houſe had not come to his Aſſiſtance; that he was carried back to his Chamber quite furious; that two Men were ſcarce able to keep him in his Bed; and that the Vein which had been opened the Day before

before had burſt open by the Violence of his ſtruggling, and was bleeding exceſſively. As he lodged in my Neighbourhood, I went along with the young Man, to ſee in what Condition he was then, and if any thing could be done for him. It was the moſt diſmal Spectacle I had ever ſeen; he was roaring and foaming, gnaſhing his Teeth, endeavouring to bite and tear any thing he could come at with his Hands and Teeth; he would bounce with ſuch Force as to heave up a Man that was lying a-croſs him, and make the Bed ſhake; his Face, Breaſt, Hands and Linnen were all covered over with Blood and Sweat: After he had almoſt exhauſted his Strength, and was panting for Breath, I ſpoke to him, he knew me, and anſwered pretty calmly; I told him it was neceſſary his Arm ſhould be bound up, leſt he ſhould faint or die by Loſs of Blood; he agreed, and as no Body elſe ſeemed fond of the Employment, I put a Compreſs and Roller about his Arm, and wiped the Sweat and Blood off his Face. As near as I could gueſs from the clotted Blood, his Linen and Bed-clothes that were wet with it, he had loſt about twenty Ounces of Blood in this Fit, which had laſted near an Hour. In this calm Interval, I asked him if he would drink, he ſaid he deſired nothing more, for he was

ex-

exceeding thirſty; I took up a Jug that was at Hand with Milk and Water, and put it to his Mouth, he ſnapt at it greedily and fixt his Teeth in it: he took in a Mouthful of the Liquor, but ſquirted it out again; he was inſtantly ſeized with a violent Convulſion, which was followed by a vomiting of a bilious Phlegm, with ſome thick black Matter like clotted Blood. Then the furious Paroxyſm returned, he raved and ſtruggled and attempted to bite. I adviſed that he ſhould be bound carefully to the Bed, and that proper Perſons ſhould look after him, which was done. Mr. *Monro* and I returned in the Evening; he was foaming at the Mouth, making a hideous Noiſe, rolling about his Tongue, and making ſuch a Sound, as Children wont to do when they deſpiſe one that talks to them as a Babler. He had a convulſive Motion like the Hickup, but ſtronger, and his Face was frequently diſtorted with Spaſms. Even at this Time he knew Mr. *Monro* and me, though he raved inceſſantly. He continued in this Condition till ſix at Night, when his Strength being quite exhauſted, he lay motionleſs for half an Hour, and then expired.

LII. *An Apoplexy, occaſioned by a Fall from a Horſe; by Dr.* CHARLES AYTON-DOUGLAS *Phyſician in* Fife.

ON the 19th of *July* 1737, *Andrew Reid* in the *Coaltoun* of *Balgony* in the County of *Fife*, a robuſt Boy of thirteen Years of Age, when at a full Gallop, fell from his Horſe; and theſe who were in Company with him, were ſo barbarous as to ride on their Journey without aſſiſting him. The Place where he fell being three or four Miles from his Father's Houſe, it was three Hours before his Friends found him lying apoplectic in the Place where he fell. As ſoon as they got him home, they cauſed him to be blooded, and put him to bed. Nothing more was done for him until the 22d, at ſeven in the Evening, when I was called, and found him abed, in ſo profound a Sleep, that we could not ſo much as make him to look up, altho' we pulled his Hair, and pinched his Skin in ſeveral Places, and he had remained ſo ever ſince his Fall. His pulſe was ſomewhat low and not frequent, and he breathed tollerably well; he had not vomited any, there was

was no Inflammation in his Eyes, and I could diſcover no external Wound or Bruiſe.

I ordered him immediately to be taken out of Bed, and put in a Chair, and adviſed them to keep him ſo as much as they could, that the Veſſels of the inferior Part of the Body, being more preſſed by their contained Fluids, and conſequently more diſtended, a Revulſion might be made from the Head; and that the Veſſels there being more emptied, the extravaſed Blood might the more readily be abſorbed by the Veins, I immediately blooded him until his Pulſe ſunk much, cauſed his Legs to be put in warm Water, and cupped and ſcarified the *Nucha*. When all this was done, we found his Head ſomewhat relieved; ſo that he ſometimes looked up, and anſwered us once or twice, when we called loud to him, and pulled his Hair. I ordered his Head to be ſhaven, that I might judge with more Certainty next Day if there was any external Wound or Bruiſe, and deſired them to give him new-made Whey for his ordinary Drink, and for Food, Water-gruel made of Oat-meal or Wheat-bread, which he took with Appetite enough.

Next Forenoon I viſited him; he ſeem'd ſomewhat eaſier than he was at firſt, but ſtill very *lethargic* with his Pulſe and breath-

ing as the Day before. After a very ſtrict Enquiry, I could diſcover no external Wound or bruiſe on his Head. I blooded him again to the Quantity of about eight Ounces, which ſunk his Pulſe for ſome Time, and I deſired to obſerve exactly the Directions formerly given as to Bathing, Diet, and keeping him out of Bed.

On the 24th he ſeemed much eaſier than he was on the 23d; ſo that frequently he anſwered us when we ſpoke to him, but he was ſtill lethargic; I cauſed him to be blooded at the jugular Vein, until his Pulſe ſunk conſiderably, and preſcribed the following Purgative to be taken next Morning, being the 25th, which was to be repeated on the 27th, ℞ *Rad. Jalap. pulv. ſcrup.* i. *Aquil. alb. gr.* v. *M. pro doſ.* And I adviſed them to give him plentifully of luke-warm Whey to drink during its operating. I obſerved that the letting Blood at the jugular Vein made a ſenſible Change on him for the better before I departed from him; and after he got the two Purgatives, which operated very well, he was no more lethargick; but his Judgment continued impaired, and he had loſt his Memory ſo much, that he could not read one Word; although before he got the Fall, he could have read very diſtinctly.

Two or three Days after the laſt Doſe of the

the Purgative, I ordered it to be repeated, and a *Seton* to be put in his Neck. The Purgative operated very well, but his Judgment and Memory continued as much impaired as formerly, and he would not allow the *Seton* to be put in, nor would his Parents allow it to be done by Force; upon which I took leave of him, and told them that I would preſcribe no more for him, until the *Seton* was tried.

I did not hear from him for two or three Weeks, in which Time he recovered his Strength, and was able to walk and ride, but he was ſtill very ſtupid, and his Memory as bad as ever, in ſo much, that if he happened at any time to walk to the Diſtance of an hundred Paces from his Father's Houſe, he ſometimes could not find the Way to it without a Guide: And in this Caſe I found him about three Weeks after he had got the laſt Purgative, when his Father told me that he had prevailed with him to allow the *Seton*; ſo it was put in, and within eight Days he recovered his Memory and Judgment, and has continued to this Day, being ſixteen Months ſince his Fall, as diſtinct as ever, and in perfect Health. I adviſed the *Seton* to be kept in for five or ſix Weeks longer, and when it was taken out, the before-mentioned Purgative was twice repeated.

LIII. *An Abſceſs in the* Cerebellum, *and Rupture of the lateral* Sinus; *by Mr.* JOHN DOUGLAS *Surgeon in* Edinburgh.

MR. *G. B.* aged 19 Years, was taken with a Pain and Heavineſs in the Forehead, for which he was plentifully blooded, vomited, purged, bliſtered, *&c.* Notwithſtanding which he was obliged to ſit always with his Head leaning forwards, otherwiſe his Pain was greatly increaſed. His Pulſe in the mean time was good; he had no Convulſions; but his Appetite was bad, his Sleep broken, and in turning his Eyes quickly, he had an Addition of Pain.

After being three Months in this way, he became free of Pain in an Evening, in the Beginning of *January* 1737, eat the Wing of a Hen, drank a Glaſs of ſtrong Ale, after which he ſlept well all Night. Next Morning he called for Tea, and immediately after fell into a ſeeming Faint, juſt as I happened to enter his Lodging. I opened a Vein in his Arm, but he did not blood, and in two Minutes died.

When his Head was opened, we ſaw two Ounces

Ounces of perfect *Pus* contained in a suppurated Tumor formed in the middle of the *Cerebellum*, and an opening of the left lateral *Sinus* of the *Dura Mater*, out of which a considerable Quantity of Blood had flowed.

LIV. *The Dissection of a* cataractous *Eye*; *by* ALEXANDER MONRO *P. A.*

December 15th 1736, in Presence of Dr. *John Taylor* Physician, and of Mr. *John Douglas* Surgeon in this Place, I dissected the Eye of a Man which had been examined while the Man was alive, by several Physicians and Surgeons, who all unanimously declared the Man to labour under a *Cataract* of that Eye.

The *Cornea* of this Eye was perfectly pellucid, without any Opacity in it;— The *aqueous* Humour seemed to be in due Quantity and Quality;— we could discover no Fault in the *Iris*;— the opac *crystalline Lens* inclosed in its *Capsula* was not so large as it is commonly in a sound human Eye; instead of being circular it was of a triangular Form, and its anterior Convexity was scabrous and inequal, of a yellowish white Co-

lour, the yellow Caſt appearing much ſtronger after the Eye was opened, than it did while the Eye was entire.—— The Connection of the *Cryſtalline* incloſed in its *Capſula* to the *ciliary Circle*, and to the *vitrous Humour*, was much weaker than it is for ordinary; ſo that by reclining the Eye to one Side, after the *Iris* was taken away, the Weight of the *Cryſtalline* made it ſeparate on any Side, from which I reclined it.--- The poſterior Convexity of the *Cryſtalline* was ſmooth, but of a more yellow Colour than the anterior Part of this *Lens*.

When an Inciſion was made into the *Capſula*, the included *Lens* ſeparated from it, without our being able to perceive any Connection between them.— The *Capſula* was opac, but of a much whiter Colour than the *Cryſtalline* itſelf.— The *Cryſtalline* was nearly of the ſame Conſiſtence all through, without either watery or gelatinous exterior Subſtance, or being harder and firmer towards the Center.—— It was all compoſed of a great many *Strata* of a greeniſh-yellow Subſtance, which became more on the green Caſt as we ſeparated the *Lamina* nearer to the Center, where we could obſerve no firm *Nucleus*.—— The *vitrous* Humour was all clear and tranſparent:--- We ſaw no Fault in the *Retina*;--- The Colour of the internal

nal Surface of the *choroid* Coat did not ſeem ſo deep as it commonly is.

LV. *A Man dead in Appearance, recovered by diſtending the Lungs with Air; by Mr.* WILLIAM TOSSACH *Surgeon in* Alloa.

I Muſt ſubmit to better Judges to determine whether the Experiment I deſign to relate was the Mean of ſaving the Man's Life on whom it was tried; it is at leaſt very ſimple, and abſolutely ſafe, and therefore there can at leaſt be no Harm, if there is not an Advantage in acquainting the Publick of it.

November 11th 1732, early in the Morning, an unuſual Steam was obſerved to come out of a Coal-pit in this Neighbourhood, belonging to the honourable Sir *John Schaw* of *Greenock*, which the People who went down to enquire the Cauſe of it, found to be the Smoak of Coals that lay about ten Fathoms from the Bottom of the Pit, and were ſome Way or other ſet on Fire in two Places. This Pit, and all the others which had any Communication with it, were ſhut up cloſe, to ſmother the Flame, and continued

thus ſhut till *December* 3d, when they were all opened. The one where the Fire had been, ſent out a moſt nauſeous Steam, ſo that no Body could come near it, except to the Windward. After ſome Hours the Colliers and others ventured down by the Ladders into this Pit, which was thirty four Fathoms deep, but ſoon came running up, all panting and breathleſs; they that came lateſt, being ſcarce able to ſpeak ſo much as to tell that one of their Number, *James Blair* was left dead.

Two Men who were no Colliers offered ſoon after to go down, and others animated by their Example accompanied them, and brought up the poor Man by Head, Shoulders, Legs or Arms; their Hurry was ſo great, they did not think how they carried him. When he came to the Mouth of the Pit, which was between half an Hour and three Quarters after he had been left in the the Bottom of it; two had him by the Arms, and two by the Feet, with his Back upmoſt. I made them immediately ſet him down at a little Diſtance from the Pit, turning him ſupine. The Colour of the Skin of his Body was natural, except where it was covered with Coal-duſt; his Eyes were ſtaring open, and his Mouth was gaping wide; his Skin was cold; there was not the leaſt Pulſe in either

Heart

Heart or Arteries, and not the leaſt Breathing could be obſerved: So that he was in all Appearance dead. I applied my Mouth cloſe to his, and blowed my Breath as ſtrong as I could, but having neglected to ſtop his Noſtrils, all the Air came out at them; wherefore, taking hold of them with one Hand, and holding my other on his Breaſt at the left Pap, I blew again my Breath as ſtrong as I could, raiſing his Cheſt fully with it, and immediatly I felt ſix or ſeven very quick Beats of the Heart; his *Thorax* continued to play, and the Pulſe was felt ſoon after in the Arteries. I then opened a Vein in his Arm, which, after giving a ſmall Jet, ſent out the Blood in Drops only, for a Quarter of an Hour, and then he bled freely; in the mean Time I cauſed him to be pulled, puſhed and rubbed, to aſſiſt the Motion of his Blood as much as I could, waſhed his Face and Temples with Water, and rubbed *Sal volatile* on his Noſe and Lips. Though the Lungs continued to play, after I had firſt ſet them in Motion, yet, for more than half an Hour, it was only as a Pair of Bellows would have done, that is, he did not ſo much as groan, and his Eyes and Mouth remained both open.

After about an Hour he began to yawn, and to move his Eye-lids, Hands and Feet;

I then put Water, in which I had dropt ſome *Sal volatile* into his Mouth, which he ſwallowed, and cauſed him to be carried into a Houſe hard by, where I ſet him in a Chair reclining backward. In an Hour more he came pretty well to his Senſes, and could take Drink, but knew nothing of all that had happened after his lying down at the Foot of the Ladders, till his awaking as it were in the Houſe.

Within four Hours he walked Home, and in as many Days returned to his Work, but complained for a Week or two of a violent Pain in his Back, which I believe was owing to the Way of carrying up him out of the Pit.

Lady *Schaw*, Mr. *Bruce* of *Kennet*, and the Reverend Mr. *Thomas Turner*, and ſeveral other Gentlemen, with three or four hundred People of the Neighbourhood, were Witneſſes to what I have now related.

LVI. *Ex-*

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LVI. *Extravaſated Blood in the* Pericardium, *by Dr.* Charles Alſton *Profeſſor of* Botany *and* Materia medica *in the Univerſity of* Edinburgh.

A Tall robuſt Man, about 38 Years of Age, ſober, regular, and delighting much in reading, who had enjoyed a good State of Health all his Life, unleſs being eaſily put into a Sweat by Exerciſe, and having rather a frequent than full Reſpiration, be eſteemed Faults in his Conſtitution, catched cold about the End of *Auguſt* 1734, and had a mild Cough, for which he took Sugar-candy and ſuch like Family Pectorals.

Sept. 12th, he was ſeized with violent Pain in one of his Kidneys, Sickneſs, and retching to vomit; his Urine in ſmall Quantity and high-coloured. I ordered him to be blooded, to take a Clyſter with Turpentine, the liberal Uſe of the *Decoctum ad nephriticos*, and an Opiate at Night. He neglected the blooding, but took the other Medicines; was ſoon free of the Pain, and never after had any nephritic Symptom.

The Cough continuing, he took *Spermaceti* and a Vomit. Finding no Advantage from

from theſe, he again asked my Advice. I ordered ten Ounces of Blood to be let, and a pectoral Electuary. Two Days after he had a Vomit with a Paregorick at Night. Next Day his Shoulders were bliſtered, and the Electuary was continued. The following Day he took a Doſe of Rhubarb, after which I ordered *Scillitic Pills* to be taken thrice a Day. By the Uſe of theſe Medicines his Cough became much eaſier, and he went abroad.

He followed his ordinary Buſineſs from the Beginning of *October* to the 6th of *January*, during which Time he did not ſleep as he uſed to do, his Appetite for Food was little, he was pale, had a Weight on his Spirits, was put into Sweat more eaſily than ordinary, ſeemed to force a Cough to free himſelf of ſome Oppreſſion on his Breaſt. Every Morning he brought up by coughing a whitiſh Defluxion, which he compared to Water-gruel. His Urine was ſometimes plentiful, at other times ſcanty; his Pulſe and Reſpiration were pretty natural, being always rather frequent than full.

In *December*, when he was eaſier than at any other Time of this Period, there was an obſervable whizzing Noiſe to be heard in his Breaſt after a full Exſpiration.

I did not viſit him regularly, but ſaw him fre-

frequently during theſe three Months, and preſcribed for him as the Symptoms were urgent. The Medicines had ſo little Effect in changing his Diſeaſe to better or worſe, that it is needleſs to be particular either as to their Form or Time of giving; I ſhall therefore only take notice of his being twice blooded, thrice vomited and as often purged, and having uſed aperient, diuretic Decoctions, Bitters, pectoral Gums and Squills. He kept a low Diet, and ſometimes rode on Horſeback.

January 7. 1735. He was alarmed with coughing Blood among his Defluxion, and ſent for me. There were only a few ſmall Strains of the Blood among a great deal of viſcid Matter; but his Pulſe was more frequent and full than it had been during the Diſeaſe, and his other Symptoms were increaſed. I cauſed him to be let Blood, put him on a Milk Diet, and gave him ſome *Trochiſci de terra Japonica.* His Pulſe becoming weaker, though more frequent daily, and the Oppreſſion increaſing, a veſicatory Plaiſter was applied to his Back on the 13th. Next Day Dr. *Porterfield* and Mr. *Monro* viſited him with me, and two Days after Dr. *Francis Pringle* was joined to us. We gave the Patient a Variety of Medicines ſuited to the Indications we had, but with-

without any Succeſs, his Pulſe becoming gradually weaker, but its Quickneſs and the Oppreſſion at his Breaſt increaſing. He complained of no Palpitation at his Heart, his Pulſe did not intermit, and he was not faint.

In the Morning of the 21ſt of *January* his Pulſe could not be felt; yet he put on his Cloaths, and ſat in a Chair till five o' Clock Afternoon, when, complaining of Pain and Coldneſs in his Legs, he bathed them in warm Water, and turning drowſy went to Bed, where he fell into a calm ſoft Sleep, in which he expired about eight in the Evening, without a Groan or Shivering.

He had frequently deſired that his Breaſt might be opened after his Death, which was done by Mr. *Adam Lindeſay* his Surgeon-Apothecary, while Mr. *Monro* and I, with ſeveral young Gentlemen Students in Phyſick, were preſent.

The Corpſe was fair, plump and well made; the Lungs were contracted more than ordinary, and in ſeveral Parts adhered to the *Pleura* on both Sides. Both Cavities of the *Thorax* contained a good deal of Water. The *Pericardium* was of a monſtrous Size. After the Water of the *Thorax* was all taken out with Sponges, the *Pericardium* being opened, three full Mutchkins (ſome more than three Pounds) of coagulated

ted Blood and bloody Serum were taken out of it. When the internal Surface of the *Pericardium*, and the external Surface of the Heart were made dry with Sponges, we could discover no Aperture in any of the large Vessels; but upon pressing the Heart a bloody Serum ouzed out from a great many small Orifices on its Surface, and principally near its Basis. The Heart and its large Vessels being then laid open, some polypous Concretions were found in the pulmonary Artery and in the Aorta, but so small, and of such a tender Substance, that we judged them to have been formed soon before his Death.

LVII. *A* Phthisis *cured after coughing a Bone, by Mr.* THOMAS ARNOT *Surgeon in* Cowpar.

DAVID HEDDERWICK a Shoemaker of this Place, a strong healthy Man 30 Years of Age, began, on the 28th *April* 1733, to complain of Difficulty of breathing, Cough, want of Appetite, and a Straitness or Lump about the upper Part of the *Sternum*, and was at the same time feverish, which Symptoms were increased by his wading

ding in a River with Fiſhers. He was blooded and vomited; the Senſation of the Lump went away, but the other Symptoms remained, and he had Stitches in his Sides, his Fleſh and Strength decaying.

I was called to him on the 23d *May*; his Symptoms were what I have juſt now related, with a whizzing ſometimes in breathing, and a hectick Pulſe, his Wife telling me that his Breath often had a very bad Smell. I let twenty Ounces of Blood, which was very ſizy, next Day I gave him a Vomit, and then made him continue the Uſe of Balſamicks and Pectorals, which made his Cough and Breathing eaſier, and his Breath leſs fetid; but the Fever, Thirſt, *&c.* ſtill continued.

On the 28th *May* all his Complaints increaſed, and I was obliged to blood him twice more, which made his Stitches milder, otherwiſe his Symptoms continued, and he had great Pain at the Pit of his Stomach when he coughed. I continued the Pectorals, and repeated the Vomit with the Addition of ſome *Acet. ſcillit.* but though his Breath was leſs fetid, he became worſe, was confined to his Bed, and was delirious.

June 2d, He had a large Sweat without Relief.

June 3d, The Cough was very violent from

from ſix to nine o' Clock, when in a ſevere Fit of coughing he threw up the Bone herewith ſent; you ſee it is about the Size of a Hazel-nut, and very ſpongy; it was covered with a bloody Stuff, and was very fetid. Immediately after this Bone, he brought up a large Spoonful of very fetid *Pus* mixed with Blood. His Symptoms immediately became all milder, only his Stomach was weak, and he nauſeated Food ſome Days, for which I gave him a Vomit, which purged as well as vomited him; after this he recovered daily, and is perfectly well.

Where this Bone came from, which plainly appears to have been the Cauſe of all my Patient ſuffered, I cannot tell; I ſuſpected he had ſwallowed it, and that it had lodged ſomewhere in the *Oeſophagus*. His Wife ſaid he had eat ſome ſtewed Veal two Days before he felt the Lump at the upper Part of the *Sternum*. But this I muſt leave to better Judges to determine.

LVIII. *An Ulcer of the Lungs, with* Hydrops pectoris, *by Dr.* THOMAS SIMSON CHANDOS's *Professor of Medicine in the University of* St. Andrews.

THERE is nothing which modern Physicians have trusted more in their explaining Diseases, than the Appearances found in deceased Bodies opened after Death; and what should give greater Satisfaction than with our Eyes to view the Seat of the Disease? But if we examine the Accounts given of such Bodies, we shall find that the Bulk of them have been made so indistinctly, and with so little Judgment, that they have rather confused us in the Investigation of the Causes of Diseases, than cleared the Way to us.

There is no Anatomist who has had Opportunity of opening any Number of Persons carried off without a manifest Disease, but who must have had convincing Proofs that there are great Numbers of preternatural Appearances in the Body which give no sensible Disturbances. How many Glands do we find every Day schirrous, of which the Patient made no Complaint? What Diversity

ſity find we in the Blood-veſſels, without any Difference, as far as we could obſerve, in the Actions of the Perſons? How oft find we the Gall-bladder filled with Stones without any Diſturbance? Nay how oft has the Kidney been found loaded with Stones, and greatly changed, while no Complaints had taken place that could manifeſt it? What Child wants Worms? and how few have the eſtabliſhed Signs of them?

One who would inveſtigate Diſeaſes among the Dead, ſhould have a large Hiſtory before him of what the Living can bear without Diſturbance: If this had been always the Qualifications of our Diſſectors, in what different Light ſhould our Hiſtories of diſeaſed Bodies appear? and what an Abridgment ſhould we have had of *Bonetuſ*'s Works? and in conſequence of this Phyſicians ſhould not have been ſo far miſled in advancing the Cauſes of Diſeaſes, and of the Death of their Patients, as to have placed every Irregularity found, as the Original of the Symptoms he had obſerved in Life. A cautious Theoriſt can never be ſatisfied in his Enquiries till he has found out the Diſorder, whence he can deduce all the Symptoms that had appeared to him by eaſy and natural Conſequences. A Diſorder that he obſerves upon Diſſection, that has no ap-

parent Connection with the apparent Diſorder that happened in the Actions of his Patient, muſt be paſſed by him as foreign to his Enquiry, or is only to be left on Record to ſee if others may afterwards find the Connection; but till then ſuch a Diſorder can never juſtly be advanced as the Cauſe of any particular Diſeaſe. I have opened a Woman, whoſe *Ovarium* filled the whole *Abdomen*, and forced up the *Diaphragm* to the third Rib from the Clavicle; and yet for all this Encroachment upon the Breaſt, ſhe breathed eaſy, and always lay horizontal: So that ſuch a Diminution of the Seat of the Lungs by itſelf, does not cauſe the worſt breathing, nor does the growing of the Lungs to the *Pleura*, many Inſtances being found of that where no Alteration in the Actions of the Breaſt appeared; yet what ſmall Degree of the *Anaſarca* quite deſtroys the Actions of the Lungs? and how ſmall an Ulcer there melts down the whole Body? By Hiſtories at the ſame time it would appear, that the Body could be ſupported till the whole Lungs were almoſt conſumed with Suppuration, or be ſpread over with Bags of purulent Matter. Such Inſtances ſhould make us very accurate in tracing where the Force of a Diſeaſe lies.

The

The learned Dr. *Freind* (*a*) has a particular Account of an univerſal Suppuration in the Lungs, and reckons that it might proceed from a general Suppuration of the Glands of the *Bronchi* formerly inviſible; but this does not at all ſeem probable to me, the Glands being Parts not apt to ſuppurate, and the very Glands themſelves being only ſuppoſed; I am apt therefore to ſuſpect, that the Structure of the Lungs has been the Cauſe of this Error in this Caſe, having found that one ſimple Ulcer is apt to raiſe ſuch an Appearance, of which I hope to ſatisfy the diligent Enquirer by the following Hiſtory.

A young Man who had happily got over the firſt Appearances of a Conſumption, was again, after ſome Years, ſeized with the ſame Symptoms, and died ſuddenly in an aſthmatic Fit, after ſpitting purulent Matter in great Quantities for ſome time. The Quantity of the Matter he had been ſpitting, and a Weight he complained of for ſome time upon the right Side of his Breaſt, made me ſuppoſe that his being ſtifled ſuddenly with a violent aſthmatic Fit, was owing to a Collection of purulent Matter in the Cavity of the Cheſt; but, upon opening him, I found it was Water that had gradually accumula-

(*a*) *Emmenalogia*, Chap. 10.

ted there, having found in the affected Side near four Pounds.

The thickeſt and upper Part of the Lungs in this Side appeared knobby and ſchirrous, in one Part of which I found a *Sinus* which could have received my Finger; in another Part there was a ſolid Hardneſs of ſome Inches, in the Middle of which lay a long ſtony Subſtance, like a Twig of white Coral. This I took to be the Effect of the firſt Fit of the Diſeaſe he had recovered of, as the *Sinus* was that of the preſent, and which had ſupplied the Matter he had ſpit in great Quantity.

Finding the right Side ſo diſeaſed, I had the Curioſity to ſlit through the thickeſt and moſt bulging Part of the Lungs in the left Side, though here they appeared of a good Colour, and no way unequal or hard, I was exceedingly ſurpriſed to find at every Straw-breadth of the Slit a Drop of purulent Matter riſe, as from a diſtinct Receptacle, till thinking with myſelf of the Structure of the Lungs, that they were nothing but a Cluſtre of Veſicles from the Extremities of the capillary Branches of the *Bronchi*, which of neceſſity would be filled with the Matter riſing from the *Sinus* by the Force of the Cough, but not carried up all the Length of the *Trachea*, the com-

mon

mon Trunk of all the *Bronchi*, and then falling back again, while at other Times all or ſome Part of it was ſpit up. As by this Conſideration I found how from one Ulcer the whole veſicular Subſtance of the Lungs could be filled with *Pus* on both Sides, ſo I found that the Appearances would often make it paſs, that the Lungs were univerſally ſuppurated when one Place only was affected. The ſame Conſideration made me ſee what different Kinds of Matter under ſuch a Diſeaſe would come from the *Bronchi*, according as it got more or leſs Time to reſt in them; and as they originally were ſupplied with ſerous Humours from *Catarrhs*, *&c.* or with *Pus* from an Ulcer, and pointed out one great Advantage of Succuſſion in riding, by which the *Bronchi* were freed of their different *Colluvies*, which of neceſſity greatly impedes the Circulation through the Lungs. Such thick Liquor, when left long undiſturbed, may become ſolid, and take the Form of Blood-veſſels, which, as *Ruyſch* juſtly obſerves, has made ſome of the moſt diligent Obſervators give us Hiſtories of Cluſters of Veſſels of great Bulk being at once rejected by coughing; whereas in Fact it was only Matter inſpiſſated and moulded in the Lungs. But to return, I reckon the opening of this Perſon

lets us ſee fully into his State under his different Circumſtances; it lets us ſee firſt, that an Ulcer had formerly cured in him, but with it Part of the Lungs was loſt; then we found what a Load one Ulcer had brought upon the Lungs; and that in this diſeaſed State, wherein the abſorbing Power of the Lungs and *Pleura* was loſt or overcome by too great a Flow of Water, perhaps from ſome burſt Lymphatic, ſudden Death happened under the Appearance of an *aſthmatic* Fit, while as yet the Perſon was not at all hectic.

LIX. *Remarks on the* Hydrops pectoris, Aſthma, *and hydropical Tumors of the* Abdomen, *by Dr.* Thomas Simson *Profeſſor of Medicine in the Univerſity of* St. Andrews.

WHILE Water in the Cavity of the *Thorax* is in ſmall Quantity, I reckon the Diſeaſe cannot be eaſily diſcovered; but when it is in ſuch Quantity as was found in the preceding Hiſtory, we may know the Diſeaſe not only from the Weight and Fluctuation it cauſes upon the Side affected, but from a Bulge it makes there croſs the Breaſt

Breaſt all along where the Diaphragm is inſerted, whence it ſpreads more or leſs to each Hand according to the Time it continues, as I ſaw in another Patient lately, who died phthiſical and aſthmatick, and who, when opened, had much the ſame Quantity of Water in the left Side of the Cheſt, as the Perſon in the above Hiſtory, of which I was ſo much perſwaded, that before his Death I had propoſed to have made the Operation for the *Empyema*, but his ſudden Death prevented me.

Hoffman, (*Frederick*) in his Account of great Quantities of purulent Matter in the Breaſt, ſays, *Si ingens puris quantitas, ad plures ſæpiùs libras, in thoracis cavo fluctuat, tumor in latere affecto circa dorſum ſatis manifeſtus, à ſcapulis uſque ad ilia, ſæpe prominet* (*a*). How ſuch a Swelling as this ſhould directly ariſe from fluctuating Matter in the Breaſt, I cannot perceive, I myſelf have often ſeen it under Diſeaſes of the Breaſt, but then there was always ſomething of an *Anaſarca* along with it, in which Caſe I was ſenſible there would be ſomething more of a Fulneſs obſervable alongſt the Back, from the Patient's being confined to a ſitting Poſture, from the Aſthma

(*a*) Syſtematis, Tom. 3. Sect. 1. Chap. vii. § xix.

ma which generally attends the *Anaſarca*, under which Circumſtances I have a phthiſical Patient at preſent, who theſe three Months has never ſlept but in a ſitting Poſture, leaning back upon Pillows; when he ſat up much through the Day, his Legs were exceeding ſwelled, and the poſterior and inferior Parts of his Thighs, (where the Water naturally runs, and is much dammed up from the Angle made there with his Legs) as likewiſe over his Back from the Angle made by the Thighs; but being obliged to keep his Bed ſome Days for his Legs, the Swelling left them and the Thighs, but was conſpicuous along the Back, equally on both Sides; whereas the Swelling I ſpeak of runs croſs the Side affected, from the under Point of the *Sternum* to the laſt *Vertebra* of the Back, to a conſiderable Breadth, ſo as to appear a very conſiderable Bulge, and ſomewhat œdematous.

I find in ſuch Caſes as have a great deal of extravaſated Matter in the Breaſt, *Le Dran* reckons that the whole diſeaſed Side of the Breaſt is affected with this Swelling (*a*); and I muſt own I have ſeen it ſpread to a great Diſtance, but in all the Caſes of this Nature which I have ſeen, the Bulge was at the

(*a*) Obſervat. tom. 1. obſerv. 31. reflect.

the Place I have marked out, and the Swelling turned leſs as it ſpread to each Side. Nevertheleſs it would appear that Water ſometimes gathers within the Breaſt to a very great Quantity, without any external Appearance or Swelling, of which *Hoffman* has a very remarkable Inſtance, in which the Water had accumulated to at leaſt eight Pounds; but then it was contained in Bags, which certainly kept it from bearing ſo much upon the *Diaphragm* (*a*), whence ariſes the Bulge I reckon the Sign of extravaſated Humours; but I would ſuſpect ſuch a Quantity as *Hoffman* ſpeaks of, could ſcarce lodge in the Breaſt, without ſome external Appearance, though expreſly he ſays, *Nihil tumoris, nihil ruboris exterius in Thoracis regione animadvertebatur:* But as he tells, us, that his Patient was ſwell'd both in Legs and Teſticles, I would ſuſpect that the Tumors in the Breaſt had ſome Correſpondence with them, and had ſent ſome of their Water thither, as they do in moſt Caſes, as I ſhall have Occaſion afterwards to remark.

While I am ſpeaking of theſe Swellings about the Confines of the Breaſt and Abdomen, for our Aſſiſtance in the Inveſtigation of Diſeaſes, I muſt take notice of another I have

(*a*) F. Hoffman, Syſt. Voll. 3. cap. 7. § 25.

have often met with in Perſons whoſe Belly was much diſtended, particularly in the *Aſcites*, covering one half of the *Sternum*, its Cartilage, and ſome Inches below; this raiſed Part looks more tranſparent than the Parts about, and preſſing its middle with your Fingers, you find a great Vacancy between the Skin and the *Sternum* or Cartilage; it is elaſtick, and ſtretched like a Drum-head. I became ſo perſwaded of ſome kind of Matter being lodged here in a young hydropic Girl, that after the Application of a Cauſtick, I cut through the Skin, but nothing appeared; after this I put in my Probe parallel to the *Sternum*, and without any Reſiſtance, carried it round below the Skin its whole Length; ſo that this elevated Place was a *Vacuum*, only a little Air paſſed upon the opening it.

The Reaſon of this *Phænomenon* I reckon to be the Diſtention of the Abdomen much beyond the Level of the Breaſt, by which the Skin, common to both Parts, is gradually raiſed from the *Sternum* that riſes not with the Abdomen.

I have found this Place in old Dropſies filled with Water, and thence extending itſelf ſo far down the Abdomen, as to reach the Part where we perform the *Paracenteſis*, which in one Inſtance, when performing

ing that Operation, occaſioned a great Surpriſe to me; for after I had drawn a Quantity of muddy Water, without altering the Poſture of the *Trois-cart*, I happened to draw it back a little, upon which I had four Pounds pure Water. In this Perſon before I performed the Operation, I felt very diſtinctly a great Diſtance between the Skin and Muſcles of the Abdomen, which gave little Reſiſtance to the Touch; ſo that in this there was two kind of Dropſies, one in the Cavity, and another between the Muſcles and Skin. Thus much for Tumors along the external Surface of the Breaſt and Abdomen.

Before I end my Letter, I muſt take notice to you, that I have found a ſmall Degree of an *Anaſarca* attended with a much greater Breathleſſneſs than the greateſt Swellings of the *Aſcites*; ſo that when I find a ſudden aſthmatick fit attack a Perſon, without any other viſible Cauſe, if I find the leaſt Fulneſs of Face or Ancles, I make no Doubt to fix upon this as the Cauſe, and I form my Indication of Cure accordingly, eſpecially if I find alongſt with it a Pulſe ſuppreſt, ſo as ſcarce to be felt. A Lady who came under my Management, after being bled and frequently vomited, and uſing ſeveral Anti-aſthmaticks, had a Thickneſs of her Face, which made me to examine her

Ancles

Ancles, and they bearing the Impreſſion of my Finger a very little, ſhewed me the firſt Degrees of the *Anaſarca*; in which caſe I never doubt of the cellular Subſtance of the Lungs being leſs or more affected the ſame way, and ſo compreſſing more or leſs the Extremities of the *Bronchi* between which they ly; and ſo ſtopping the whole Circulation, which few other Cauſes of an *Aſthma* can do; a general Spaſm, the *Bronchi* univerſally filled with Matter, or Water or Matter in the two Cavities of the Cheſt, being the other Cauſes we can ſuſpect for it; between which there are ſigns ſufficient to diſtinguiſh which of the Species take Place. In my Patient I became ſo poſitive about the Cauſe, that I doubted not that very Night, when every body look'd upon her as dying, and her Pulſe was ſcarce to be felt, to give her ten Grains of *Sweet Mercury*, by which her Breath and Pulſe was reſtored in the Morning, after purging two or three times, and repeating it twice or thrice, at the Diſtance of a few Days, quite recovered her of both Swelling and *Aſthma*; the firſt of which was ſo ſmall as to require a diligent Attention to be ſenſible of it; and thus by an anatomical Conſideration, I was directed to the Cure of my Patient, as I am in many other Caſes,

Caſes, when doubting which Method of a great many in Vogue to follow.

As Diureticks and Quick-ſilver have been famed for their Service in the *Aſthma*, have we not Reaſon to ſuſpect that an *Anaſarca*, ſo obſequious to theſe Remedies, is often the Foundation of the *Aſthma*?

LX. *A Phthiſis, occaſioned by a Tumor under the left* Scapula; *by Dr.* CHARLES AYTON-DOUGLAS *Phyſician in* Fife.

ABOUT two Years ago I was called to —— *Roger* Son to —— *Roger*, Farmer in *Strathudie*, who ſhewed me a Tumor under his left *Scapula*, which he ſaid was as large as a Penny-loaf before he hurt it, but when he ſhewed it to me, it was the one half leſs. It ſeemed to be contained in a Bag immediately below the Teguments; he ſaid that it had continued two Years, but that it had not been painful until about a Month before, when he accidentally hurt it; upon which it became painful, and he was ſeized with a violent Cough, which moleſted him Night and Day. He ſpit up a great deal of yellow, thin, ſtinking *Pus*, mixed with ſome Blood. His Pulſe was very frequent

quent and hard; he had a great Heat over all his Body; he was much extenuated, and his Appetite was very bad; he added, that before he hurt the Tumor, it did not give him much Uneasiness; that his Appetite was pretty good, and that he had Strength enough for working the hardest Country-work; and, upon my enquiring narrowly, he recollected that he had had a pretty severe Fever and a Cough, and a Stitch in the Place where the Tumor formed, a little before the Tumor began.

I imagined my Patient would die very soon if I opened the Tumor, by the large Discharge and collapsing of the Lungs, and therefore advised him to be very regular in his Diet, and use nothing for Food but *Hippocrates*'s Ptisan, which is much commended by its illustrious Author, or Oats well husked and prepared in the same manner, or Rice as long boiled as *Hippocrates*'s Ptisan, Cow-milk, with the natural Heat, or Butter-milk: I also ordered him to take every Morning, and at four in the Afternoon, two or three Tea-cupfuls of the Infusion of *fol. & florum tussilaginis, fol. capil. veneris & urticæ*, and the following Pills, ℞ *Terebinth. Venet. Unc. sem. Glycerrhiz. pulv. q. s. ut fit massa pilulis formandis idonea, capiatur una gr.* iv. *omni quadrihorio.*

He

He continued under this Regimen for a Fortnight, and the *Tumor* was conſiderably leſſened, and all the Symptoms became milder: However he was ſtill hectic, with a bad Cough, and I had little Hope of ſubduing ſo obſtinate a Diſeaſe by any Method; but I recollected, that the ancient *Greek* (*a*) and modern *Ægyptian* (*b*) Phyſicians ſeem to depend much on Iſſues put in with an actual Cautery betwixt the Ribs in a dependent Place, in any Suppuration of the Lungs or *Pleura*, even in an *Empyema*, Inflammation of the Lungs, and an *Aſthma*: That the Inuſtions mentioned by theſe Authors were Iſſues, is pretty plain; for they order the Eſchars to be ſeparated, and the Ulcers to be kept open until the Recovery of the Patient; and being of the Opinion that one *Seton* is equivalent to ſeveral Iſſues, I ordered one to be put in parallel to the Ribs, and betwixt two of them that were immediately under the moſt dependent Part of the Tumor; but the Tumor itſelf was not pierced. The good Effects of this were beyond my Expectation; for within eight Days after it was put in, the hectic Fever went quite off, his Cough was conſiderably eaſier, and the *Pus* that

(*a*) Hippocrat. Aphoriſ. libr. vii. & de morbis, lib. 2. & 3. Galen, lib. vii. comment. in Aphor.

(*b*) Vide Proſper. Alpin. de medicina Ægyptiorum.

he spit up became of a better Colour and Consistence, and that which was evacuated plentifully by the Seton, was pretty good and turned gradually better. He recovered his Flesh and Strength by quicker Degrees than one could have expected, and in a little Time the Bag under the *Scapula* that contained the Matter was quite emptied. Some Days after this he was able to sit on a Horse, and I advised him to ride, especially in the Forenoon, and to use that Exercise as much as he could, without fatiguing himself, and to continue the Regimen already mentioned, except the Pills, of which he got no more than the Quantity that I wrote for at first.

An uncommon Symptom happened about the time that the Matter was all evacuated from the Bag; for whenever he chanced to be seized with a Fit of coughing, the Air was forcibly driven from his Lungs into the Bag in which the Matter had been lodged, and distended it to about the Bigness of an *English* Quart-bottle; and when the Fit of coughing was over, the Air was gradually forced back again into the *Thorax*. All his Friends and Neighbours were much surprised at this Symptom, for which I prescribed nothing but a Compress and Bandage moderately tight, and the same Regimen as formerly: The Sides of the Bag were gradually consolidated

lidated from the Circumference to the Center; and the laſt Time that I obſerved any Air forced into it, it was not diſtended to above the Bigneſs of a Pigeon's Egg: In ſhort, within five Weeks after the Air was obſerved to come into the Bag, it was quite agglutinated and healed; and about two Weeks after that, the Seton was taken out; and by that time he had fully recovered his Appetite, Vigour and Fleſh, and has continued in a firm State of Health ever ſince.

From this Hiſtory, and from the Caſe I ſent you lately of a Boy made firſt apoplectick, and then ſtupid by a Fall (*See Art.* LII.) And indeed from the good Effects of Iſſues and Setons in many Caſes, it would appear that obſtructing or heterogeneous Matter in the Blood flows much by ſuch Drains. Is it not reaſonable then to make Trial of Setons in dangerous Diſeaſes, ſuch as *nervous Fevers*, where the Head is much affected, *Pleuriſies*, *Peripneumonies*, &c. ſince for certain they cannot do any Harm?

Since writing theſe two Caſes, I have cauſed Setons to be put into Patients in very dangerous Fevers, where the Head was much affected, with remarkable Succeſs.

LXI. *An uncommon Convulſion of the Trunk of the Body cured; by Mr.* THOMAS ARNOT *Surgeon in* Cowpar.

A Boy paſt eight Years old, had laboured ſix Weeks under violent Pain of his Belly, which was not conſtant, but attacked him from time to time, and had taken Medicines againſt Worms and ſome others, without any Relief, when my Advice was asked for him. While I was with him, the Pain ſeizing him, I laid my Hand on his Belly, and felt the abdominal Muſcles of the right Side ſtrongly contracted; and ſoon after he was thrown a Yard foreward on the Floor, all his Body being drawn together; this put me on examining the Appearances of theſe Convulſions. He was taken with them almoſt every Quarter of an Hour of the Day, but was free of them in the Night: They began with the Senſe of Pain in his Belly; then he was thrown by the convulſive Contraction from his Seat on the Floor, as already deſcribed, his Arms and Legs being ſeized alſo with the ſame Contractions: He became inſenſible, but did not foam at the Mouth, or void Urine or *Fæces*; nor were

were his Hands or Fingers contracted, tho' his whole Body was violently bended by the Convulſion. When the Fit was over, he underſtood every thing, being reſtored to his Senſes, but complained of being all pained and feeble.

I gave him a Vomit of *Ipecacuan*, and applied a bliſtering Plaiſter on his Shoulders; then he got the following Infuſion and Pills. ℞. *Rad. Pæon. drach.* vi. *Hellebor. nigr. Jalap. a drach.* iii. *Valerian. ſilv. unc.* i. *Caſſuminar. dr.* i. *Cort. cinamon. ſcrup.* ii. *fol. Senn. dr.* vi. *Rut. Roriſmarin. flor. lavend. a. M.* i. *Sem. Anis. Carv. Fænicul. d. a. dr.* ii. *M. incis & contus. affund. Vin. alb. lib.* i. *ſem. Sp. lavend. comp. dr.* i. *Aq. Pæon comp. Rut. a drach.* ii. *M. poſt biduum coletur.*

℞. *Gum. Galban. Aſafætid. Diagrid. Mercur. dulc. a ſcrup.* i. *Caſtor. Aloes ſocotrin. a. drach. ſem. ſal. ſuccin. gr.* x. *ol. aniſi, gut.* viii. *Balſam. Peruvian. q. ſ. ut ft. pilul.* xxiv.

Twice a Week he took the Pills at Bed-time, and next Morning ſwallowed two Spoonfuls of the Infuſion when he awaked, and as much at eleven o'clock in the Forenoon; at Night after the Operation of the Phyſick, he took a Spoonful of the following Mixture, ℞ *Aq. Pæon. Theriac. Sp. Lavend. compt. a. unc.* i. *Aq. Rut. unc.* ii. *Cinam. fort. Cerasnigr. Tinct. Caſtor. a.*

unc. ſem. Syrup. ex extract. papav. alb. unc. iv. *M.*

In the Days free from the Purgative, he took a Doſe thrice a Day of the following Powders, ℞. *Myrrh. Caſtor. Succin. alb. ppt. C. C. C. Coralin. Cinab. nativ. a drach.* i. *Mercur. alcalizat. Sacchar. cryſtal. alb. pulv. Rad. Pæon. a. drach.* ii. *Valerian. ſilv. drach.* iii. *ol. aniſ. gut.* x. *M. ft. pulv. cujus ſint. ſcrup.* ii. *p. doſi.*

After he had taken theſe Medicines ſome Days, with little Benefit, I applied the following Plaiſter to his Belly, ℞. *Empl. Hyſteric. Diachyl. cum Gumm. a unc. ſem. Oxycroc. Gum. Aſafætid. Terebinth. Venet. a. drach.* ii. *extract. papav. alb. unc. ſem. ol. ſuccin. cariophyl. a gut.* x. *Pulv. ſem. cymin. drach.* ii. *M. extend. ad alutam.* This Plaiſter had not been applied two Days, when his Fits went quite off, except that one of them came for three Days exactly at five o'Clock in the Evening, after which, for ſix Days he had only a yawning at that Hour, which gradually decreaſed, till after the Uſe of the Medicines, a few Weeks, he was altogether free, and ſoon recovered his Fleſh and Strength, which had been greatly impaired by the Diſeaſe, of which he has had no Return.

I cannot help thinking that the *Extract*

off

of the Poppies in the Plaiſter contributed greatly to the Cure, by at leaſt giving a Truce from the Diſeaſe, till the other Medicines had time to rectify the Diſorder in the Nerves.

LXII. *An uncommon Tumor of the Belly and a Dropſy cured; by Mr.* PATRICK MURRAY *Surgeon in* Earlſton.

Isabel Park, about twenty ſix Years of Age, had frequent Suppreſſions of her *Menſes* for eight or nine Years, and Pains in her *Scapula* and right *Iſchium*. Five Years of this Time ſhe was troubled with Pains about the Region of the Liver; her Appetite was bad, and ſhe had a ſhort dry Cough, with periodical Paroxyſms like thoſe of an intermitting Fever, after which two Tumors appeared under the Baſtard Ribs of the right Side, which gradually increaſed, without changing the Colour of the Skin, till they were as large as Childrens Heads; they were ſoft, yielding ſomewhat to Preſſure, but without any Fluctuation, Pulſation, or Pain in them, but occaſioning very violent Pain along her Side, as far as the Armpit; the Baſe, ſo far as could be judged

by the Fingers, being within the Muscles.

She continued in this melancholy Condition seventeen or eighteen Months, taking no Medicine, except some Drops of *Laudanum*, when the Pain was most severe.

In the Beginning of *August* 1732 the two Tumors joined into one, and an evident Fluctuation of Liquor under the Skin was felt: The Swelling was as large as that of Women in the last Months of Pregnancy; and the Pain in it was exceedingly violent.

I gave her a gentle Dose of *Pilulæ ex duobus*, which purged her pretty well; few Days after which she took a violent purging of very viscid Matter, mixed with a gross parenchymatous-like Substance, pretty near the Consistence of well-wrought Curd, with little or no fetid Smell. She took a *Scruple* of *Pilulæ ex duobus* that Night, and as much next Morning, with four Grains of *Resin of Jallap*. This Purgative operated nine or ten times, and brought away great Quantities of that sort of Stuff.

The two succeeding Days she took four Ounces of a bitter chalybeat strengthning Ale twice, then I renewed the purgative Pills; and in this Method of taking the medicated Ale two Days, and the Pills the third Day, I continued for a Month, the Tumor and other Complaints lessening daily,

till

till in ſix Weeks ſhe ſeemed to be free of all of them, and ſhe lived in a good State of Health three Years.

In the Beginning of *December* 1736, ſhe ſhewed me watery Swellings of her Legs, Thighs and Belly; her Urine was in very ſmall Quantity; her Breathing was ſo difficult, that ſhe was obliged to ſleep in an erect Poſture, being like to ſuffocate when ſhe attempted to ly. She had great Thirſt, and a quick feeble Pulſe.

I gave her three Doſes of the purgative Pills, with ſome *Sal ſuccini* in ſix Days, which did not decreaſe the Swelling. I then made her take four Ounces twice a Day of the following Ale, which I have found of great Service in Dropſies.

℞. *Ciner. Geniſt angulos trifol. lib.* i. *Limatur. Mart. unc.* iv. *Sem. Sinap. unc.* ii. *M. infund in Cerevis. nov. lib.* xii. *poſt biduum cola.*

The firſt Doſe of this Ale brought away full five *Scotch* Pints (*lib.* xx.) of Water by Urine. By the alternate Uſe of the purgative Pills every 3d Day, and of the hydragogue Ale in the intermediate Days, for three Weeks; and of the Pills only once a Week, and of the Ale all the other Days for four Weeks more, with a Prune kept in her Mouth inſtead of Drink; all the Water was drained

drained off, and ſhe was brought to a good State of Health, which ſhe ſtill enjoys.

LXIII. *A* Hydrops Aſcites, *from a Tumor depending from the Navel internally; by Mr.* William Johnston *Surgeon in* Drumfries.

AGnes Sword, who had born ſeveral Children, imagined herſelf with Child in the 43d or 44th Year of her Age, and after going a Year, had violent Pains like thoſe of Labour, for 18 Hours, having ſome alterative Medicines given her. After this her *Catamenia* returned, and ſhe continued regular eight or nine Months; at the End of which ſhe had a Flooding, which continued five or ſix Minutes, and the *Menſes* returned no more. She had a Fulneſs and Swelling of her Belly from the Time ſhe thought herſelf with Child, which increaſed greatly, after having her Belly bruiſed in the 15th or 16th Month of her Diſeaſe. She continued in a ſickly Way about ſix Years more, and was ſo hydropical in *March* 1738, when ſhe firſt conſulted me, that by the Advice of Dr. *William Cochran* I tapped her, and in fourteen Months after, I repeated that Operation

ration twelve times; the Quantity of Water which I let out was ſometimes greater, (once 82 *lib.*) at other times leſs; in all it amounted to 716 *lib.*

The eight time ſhe was tapped, the Liquor was fetid; in the 9th, 10th, 11th and 12th, or laſt Operation, it was not ſo ſtrong ſmelled, but the Silver *Canula* was gilded of a blewiſh Colour, when it was taken out of her *Abdomen*; and after the Evacuation of the Water by the three laſt Operations I obſerved a heavy Ball fall from the upper Part of the Belly to the *Oſſa pubis*.

On the 27th of *May* 1739 ſhe died; when her Body was opened, a large carnous Excreſcence was found depending from the Navel, by a Neck of about two Inches diameter, the Excreſcence adhered to ſeveral other Parts of the *Peritonæum*, but ſo weakly, that I eaſily ſeparated it with my Hand, and could ſee no Appearance of any Veſſels, except at the Neck already mentioned.

When I opened the Excreſcence, it appeared all compoſed of Cells, communicating with each other; ſome containing a ſerous Matter, others were full of a Subſtance of the Conſiſtence of Marrow. From theſe Cells, Tubes ſo large as to receive a Gooſe-quill, and full of the ſame ſort of Matter as was in the correſponding Cells went out to the Navel,

vel, being contained in a thick muſcular Subſtance, of which the Neck of the Tumor was principally compoſed. This Excreſcence weighed eight Pounds.

Nothing was to be ſeen in the *Viſcera* remarkly deviating from the common Structure.

LXIV. *An* Aſcites *in a pregnant Woman*; *by Mr.* THOMAS LAURIE *Surgeon in* Selkirk.

A Woman about 36 Years of Age, the Mother of ſix Children, of a good Complexion, and generally healthy, except that ſhe was ſubject to ſome hyſteric Diſorders after Child-bearing; about *November* 1739, perceived a Tumor beginning immediately under the *Coſtæ nothæ*, which ſtretched itſelf gradually forwards and downwards, till paſſing the *Linea alba*, ſome Inches below the *Umbilicus*, it filled the whole *Epigaſtrium*, to the *Cartilago enſiformis*; ſo that her Belly was diſtended to the Bigneſs it uſed to be in her laſt Months with Child. The Tumor was pretty hard to the Touch, but ſhe did not complain much of Pain in it. Several Medicines were given

ven her internally, and ſome external Applications uſed, but to no Purpoſe, it ſtill increaſed.

About the 12th of *Auguſt* 1740, as ſhe was going about her Houſe, ſhe imagined ſomething crack'd within her, and the Tumor diſappeared of a ſudden, at leaſt was leſs circumſcribed, being more diffuſed thro' the *Abdomen*; ſhe immediately fell into fainting and vomiting, and became feveriſh; ſhe then ſent for me, and told me what had happened: I gave her an opening Ptiſan of *Tamarinds*, *Sena*, *Rhubarb*, &c. which had very good Effects, for it purged her exceeding well for ſeveral Days, and probably, if ſhe had continued to uſe it as directed, the Matter might have been entirely evacuated: But growing impatient under the frequent purging, ſhe left off the Ptiſan, and took ſomething binding, without my Knowledge, by which both her Urine and Purging were ſtopt, and her Belly began to ſwell.

When I was called again, I employed all my Care to reſtore theſe Evacuations, but without Succeſs. I then deſired her Husband to call Dr. *Plummer*, who was then in the Country; he preſcribed ſeveral diuretick and purgative Medicines, which had little Effect as to bringing down the Swelling of her Belly. The Doctor at his next Viſit propoſed the *Paracentheſis*, as the moſt certain

certain and expeditious way of freeing her from that Load of Water which diſtended her Belly. She would not comply with the Propoſal at firſt; but after a Day or two, finding the Swelling ſtill encreaſing, ſhe ſubmitted to the Operation, which I performed in Preſence of the Doctor upon the 13th of *September*; and, by the Help of a good Belt, and gentle Compreſſion, drew off at once eight *Scots* Pints of Water, which was all that could be preſt out. She behaved with great Firmneſs under the Operation; her Belly fell to its ordinary Size; ſhe was perfectly eaſy, got good Reſt the Night following, and paſt plenty of Urine. In few Days the Diſcharge of Urine ſtopt, and her Belly ſwelled apace; ſo that by the 20th of *September* it was as big as before the Operation. The Patient urged that ſhe might be tapped again immediately. I declined it, till I ſhould acquaint the Doctor, who ſuſpecting that this Diſtenſion might be moſtly occaſioned by Air pent up in the Inteſtines, or Cavity of the *Abdomen*, propoſed carminative and ſtrengthning Medicines; but as he could not have an Opportunity to examine into it, being to return to *Edinburgh* next Day, he directed me to enquire carefully into all the Appearances; and if I was ſatisfied there was a conſiderable Collecti-

on

on of Water, to make a new Puncture: Accordingly on the 22d I drew off other four Pints; ſhe ſoon after paſt Urine with Eaſe, and in good Quantity, and reſted very well that Night: But next Morning ſhe was ſuddenly ſeized with a Trembling, Vomiting and Suppreſſion of Urine. I then concluded ſhe was gone, for by this time ſhe was brought very low: She acquainted me, that there had happened to her a *procidentia uteri*, to which I attributed theſe violent Symptoms which had followed. I directed her Midwife to preſs up the *Uterus* gently, and apply an aſtringent Fomentation to the Parts. When the Symptoms were a little abated, I attempted to make ſome Evacuations, by ſuch Means as would occaſion the leaſt Diſorder; but notwithſtanding theſe, her Urine was very ſcanty, and her Belly ſwelled. She inſiſted on being tapped a third time, and although I feared ſhe would not be able to ſtand it out, yet as ſhe preſt it much, and had ſhown ſo much Reſolution formerly, on the 2d of *October* I made a Puncture in the oppoſite Side of the *Abdomen*, by which I diſcharged four Pints more of Lymph; and to prevent the *Procidentia uteri*, I cauſed the Midwife to apply the ſtrengthning Fomentation pretty conſtantly all next Night. From this Time every thing went well;

well; ſhe daily recovered her Strength and Fleſh, and has ſince brought forth a healthy Child, and ſhe herſelf continued in good Health. By computing from the Birth of the Child, it appears that ſhe had conceived three Months before the *Paracentheſis* was firſt performed, of which ſhe had no Suſpicion herſelf; and notwithſtanding ſhe had taken ſeveral Doſes of *Mercurius dulcis*, and other hydragogue Purges, yet ſhe brought the Child to the full Time.

LXV. *Of the Cure of the* Cholera; *by Dr.* Charles Ayton-Douglas *Phyſician in* Fife.

THE *Cholera*, which is a violent Vomiting and Purging of Bile and other acrid Humours, being a Diſeaſe ſo acute and deadly, as frequently to deſtroy a Man in the Space of twenty four Hours, when a Phyſician is not to be had, which is frequently the Caſe in the Country; or when a wrong Method of Cure is preſcribed, which I am humbly of Opinion *Etmullerus*'s is, who recommends Vomits, Purges, and Sudorificks, which ſeems to be adding Oil to the Flame: I hope therefore my Countrymen

men will take in good Part my publiſhing a Method of curing it by a Medicine which is always at Hand, even in the Houſes of the meaneſt Peaſants, which I have tried often, and never found it fail.

If the Patients be not too much exhauſted before I am called, I make them drink heartily of warm Water three or four Times, which they always throw up; this dilutes, and ſo blunts the Acrimony of the Humours, and at the ſame Time evacuates them: immediately after I adviſe them to drink plentifully of a Decoction of Oat-bread baked without any Leven or Yeſt, carefully toaſted as brown as Coffee, but not burnt; which Decoction ought to be of the Colour of Coffee, when it is weak. This Preſcription I have always found my Patients moſt willingly obey, their Thirſt being generally very great, and they always affirm that it is moſt grateful to their Stomachs; and I muſt add, That I do not remember that any of them ever vomited it. I have always uſed Oat Bread, but when it cannot be had, I doubt not but Wheat-bread, or Meal well toaſted may do.

But when the Patient is much exhauſted with violent Evacuations upwards and downwards, the firſt thing that I give him, is a large Draught of the above-mentioned De-

coction; and when the *Nauſea* is pretty well ſettled, I frequently order a Pill of *Opium*, to the Quantity of two thirds of a Grain for an ordinary Perſon, increaſing or diminiſhing the Doſe, according to the Age or Strength of the Patient.

But if the Patient be convulſed, and the extreme Parts cold, and his Pulſe weak, and intermitting, then it is proper to give a ſtrong Doſe of *liquid Laudanum*, becauſe it has its effect ſooner than the *Opium*, ſuch as *gut.* xxv. for an ordinary Perſon, in an Ounce of ſtrong Cinnamon Water, and afterwards a Draught of any Wine that is moſt agreeable to the Patient, mixed with an equall Quantity of the Decoction; and they may afterwards take the Decoction to quench their Thirſt; and now and then they may take a little Wine mixed with it, according as they need a Cordial. To prevent a Relapſe, which the Patient is not able to bear, it will be proper to repeat the Opiate in a moderate Quantity for ſome Days, Morning and Evening; and Care muſt be taken not to overload the Stomach, or to eat any thing but what is of good Nouriſhment, and eaſy to digeſt, and grateful to the Stomach.

It may be obſerved, That the above Preſcription is to be uſed when the Patient is

quite

quite exhauſted, and in the very Jaws of Death; but in ordinary Caſes, when the Patient is not much exhauſted, and Opiates are not to be had, or if the Patients Conſtitution diſagrees with them, then the Decoction itſelf may be truſted to.

What engaged me to preſcribe the above Method of Cure to others, was my having tried it on myſelf with Succeſs. A great many Years ago I was extremely ill of a *Cholera*, and the Evacuation upwards and downwards was ſo violent, that in the Space of ſix Hours I was not able to ſtand unſupported; and I vomited *Laudanum* and every other thing that could be thought on; but I longed much for a Draught of the Decoction above-mentioned, and I imagined that I would not vomit it, although at the ſame time I loathed violently every other thing that any of my Friends that were about me mentioned to me. As ſoon as a large Quantity of the *Decoction* could be got ready, I drank heartily of it, and it ſtopped both the vomiting and purging. Two or three Days after that, by being careleſs about my Diet, and the other Non-naturals, I relapſed, and was immediately again cured by the Decoction of toaſted Bread; ſince which I have cured great Numbers with it.

A Lady of my Acquaintance told me

within this Fortnight, that about eight Days before ſhe had a ſevere *Cholera*, in which ſhe vomited every thing that was preſcribed for her; but longing as earneſtly as Women with Child uſe to long for any thing, for the Decoction of toaſted Oat-bread, ſhe drank ſeveral Draughts of it with great Pleaſure, and was cured immediately.

A Phyſician of my Acquaintance, to whom I communicated this Method of Cure, aſſures me that the Decoction itſelf, without any other thing, cured a Patient of his who was brought very low by a *Cholera* occaſioned by a *Salivation*, after he had in vain tried every other thing that he could think on.

This Medicine is not indeed a pompous Compoſition, and has not in it Emeralds, Pearls nor oriental Bezoar, recommended by *Doleus* and ſeveral other famous Practitioners; but it is not far different from *Celſus*'s Method of Cure; for he (*a*) preſcribes in the Beginning vomiting with warm Water to be repeated frequently; and he ſays they ſhould ſmell Penyroyal dipped in Vinegar or *Polenta* ſprinkled with Wine; and a little after that he adviſes the Patient to take Wine and Water mixed with *Polenta*. And *Paulus Ægineta* (*b*) preſcribes vomiting with

(*a*) De re medica, lib. iv. cap. 11.
(*b*) lib. iii. cap. 39.

with warm Water, and after that an Opiate.

Polenta is mentioned by ſeveral of the ancient *Greeks* and *Romans* as a thing generally uſed in their Time. *Pliny* (*a*) ſays that it differeth from Barley-meal, in ſo far as it is much toaſted or parched; and to that he thinks it owes its aſtringent Quality, being good for the Stomach, and that it ſtops a *Diarrhœa:* And ſeeing it differed from Barley-meal, only in ſo far as it was fryed or very much toaſted, it could be made of nothing but Barley fryed or toaſted brown, and grinded to Powder: And elſewhere (*b*) he deſcribes it to have been made after this Manner by both the *Greeks* and *Italians*; but he adds, That they frequently mixed with it a little Lintſeed, ſome Salt, and ſome Coriander-ſeed. It is alſo mentioned by *Hippocrates* (*c*), and it is deſcribed by *Paulus Ægineta*, as made of Barley fryed or much toaſted; and he recommends it to be drank mixed with Water for quenching Thirſt (*d*): And it appears from the holy Scriptures to have been uſed by the *Jews*, as antiently as the Reign of King *David* (*e*), from whom, or the *Syrians*, it is probable

(*a*) Hiſt. Natural. lib. xxii. cap. 25.
(*b*) Lib. xviii. cap. 7.
(*c*) Vid. de Affectionibus.
(*d*) Lib. i. cap. 78.
(*e*) 2 Sam. cap. xvii. ver. 28.

bable that the *Greeks* borrowed it; for by their own Confeſſion they were much obliged to the *Syrians* and other Eaſtern Nations for many of their Cuſtoms, as well as for ſome of the politer and more uſeful Arts and Sciences; and ſeeing it was uſually drank mixed with Water, eſpecially with bad Water, to make it wholſome and well taſted (*a*). It is probable that the *Arabians*, who were Neighbours to the *Syrians*, and inhabited a dry and barren Country, where little Corn was produced, and Coffee-berries grew plentifully with little or no Culture, found it moſt convenient to make their *Polenta* of the Berries, or they might uſe a Decoction of them toaſted, inſtead of the *Polenta* which their Neighbours the *Syrians* mixed with their Water.

LXVI. *Fatty Subſtances voided by Stool, after a violent Strain of the Back; by Mr.* Thomas Arnot *Surgeon in* Cowper *of* Fife.

David Thomſon a Weaver in the Pariſh of *Kettle*, about forty Years of Age, attempting to take up a very heavy Veſſel, felt

(*a*) Plin. natural. hiſt. lib. xxv. cap. 3.

felt his Back-bone, immediately above the *Os ſacrum* make a great Crack, with moſt violent Pain, in that Part, and at the ſuperior *Vertebra* of the Loins; he immediately loſt all Power of his Legs, and fell to the Ground, without being able to move out of the Place; and it was with the utmoſt Difficulty that he could allow himſelf to be carried to his Bed. The Pain continuing long very ſevere, he fancied that the Bone was diſlocated inwards; and, to reduce it, made one of his Neighbours pull his Belly backwards, while another getting on his Shoulders preſſed them downwards and forwards, by which he thought his Loins were much ſtraighter than formerly, and he had leſs Pain.

Some Days after this a Country Boneſetter undertook to put all the Bones right, making one Man pull at his Shoulders, and the other at his Legs in a contrary Direction. By this Extenſion he was put to moſt exquiſite Torture, and all his Complaints were increaſed.

Three Months after he began to recover the Power of his Legs ſomewhat, ſo as to crawl out of Doors, and then obſerved among his Excrements a whitiſh Subſtance about the Bulk of a large Walnut, Part of which I have herewith ſent you; it is, you

ſee, like Tallow or hardned Marrow, compoſed of ſmall Globules; it melts with Heat. During ſeveral Days after he obſerved Pieces of the ſame ſort of Subſtance, of the Size of Kidney-beans or Peas, come away among his *Fæces*, he thought all theſe leſſer Pieces, if they had been put together, would have been equal to the large Piece he paſſed firſt.

The Man continues ſtill unable to follow his Buſineſs, and cannot turn the Trunk of his Body to any Side without great Pain.

LXVII. *Hiſtories of the Separation of the villous Coat of the Inteſtines in Diſeaſes, in a Letter to* Alexander Monro *P. A. from Dr.* THOMAS SIMSON *Profeſſor of Medicine in the Univerſity of* St. Andrews.

I Imagine the two following Hiſtories may give ſome Hint when the *villous Coat* of the *Inteſtines* is rubbed off, which, in your ingenious Paper upon the *Duodenum*, in the fourth Volume of Eſſays, you obſerved to be a Caſe not ſo eaſy to be inveſtigated, and therefore ſend them to you with a ſhort Comment.

May 20. 1725. A Maker of *Golf-balls*, who

who had ſuffered long by a *Pthiſis pulmonalis* and *Fiſtula ani*, dying, I was deſired to open him for the Satisfaction of the Friends, though I had not ſeen him under his Illneſs.

The *abdominal Viſcera* ſhewed nothing obſerveable, till the Stomach and Inteſtines were laid open; ſcarce in them were found one of the Valves or *Rugæ*; nay the pulpy villous Coat was to be met with in very few Places, but plenty of abraded Pieces of Membranes ſcattered up and down in them, in an inflammatory State, looking as if injected; while the nervous Coat appeared both in Stomach and Inteſtines neat and clean, no way covered, only at the *Rectum* and Part of the *Colon* next to it, there were ſeveral gangrenous Stains: The Side of his Breaſt he leaned his Inſtruments upon, in beating in the Stuffing of his Balls was much depreſt through its whole Extent, and the other was thruſt out as much: In the depreſt Side no Lobes of the Lungs could be diſtinguiſhed, and the Lungs were of as deep a Red, and as firm a Subſtance as thoſe of a boiled Fowl, and were quite united to the different Parts ſurrounding them.

I was informed that he had eat no ſolid Meat for a very long time, becauſe of the great Uneaſineſs he had in his Stomach and

through

through his whole Belly, upon taking any thing; and that for the three laſt Weeks he had ſwallowed over nothing but now and then a Spoonful of Water ſip and ſip, every Gutt that went into his Stomach burning like a Coal, and diſordering his whole Fabrick.

II. A young Woman, who in her younger Days was threatned much with a Decay, and for a Dozen of Years was much ſubject to ſlow, remitting Fevers, all along had the moſt delicate Stomach one can imagine, nothing but repeated cautious Trials by herſelf being able to determine what drink ſhe could bear; Zery dropt amongſt Water is what ſhe ventures moſt upon, though the Wine of this kind, which other People give her in Compliment, muſt be cautiouſly tried by herſelf before ſhe can be free in the Uſe of it; teſtaceous Powders generally gave her Relief under the ill Fits, but the continued Uſe contributed nothing to harden her Stomach againſt new Attacks, a cautious Diet being the only thing under which ſhe got Reſpite, though often ſhe had Attacks when moſt careful this Way; for the bygone Year ſhe has had frequent Fits of the *Dyſentery* affecting the whole Abdomen, though the *Teneſmus* continued longeſt, and gave her the greateſt Uneaſineſs. Under the firſt Fit, which

which was the ſevereſt, obſerving that the mucous Stuff ſhe paſſed in great Quantities, lay in Parcels ſomewhat firm and coherent, ſhe had the Curioſity to reſerve ſome of it for my Examination: This I found of different Forms, ſome Parts of it one would have reckoned, from Colour, Length and Shape, to have been a round human Worm bruiſed; but laying it in Water, and ſpreading it, I found it altogether fibrous, or rather vaſcular, made up of larger Veſſels parallel one to another, as thick as an Horſe's Hair, between two and two of which ran other Veſſels as big as a human Hair of a reticular Diſpoſition; ſome Lozenges were about the Fourth of an Inch in Diameter, but others much larger, all of them were tranſparent and knotty like Lymphaticks: In this Form I ſpread Parcels of it out, between two and three Inches in Breadth, and ſix or ſeven in Length, in ſeveral of them both the larger and the ſmaller Fibres appeared every Way intire, though eaſily broken when handled; in other Parcels the fibrous Part was ſo diſſolved, that they appeared one coagulated Lump like the White of an Egg, though even theſe, when carefully examined, ſhewed more or leſs of the fibrous Part. Several times ſince, in the different Attacks of the Diſeaſe, the ſame

mucous

mucous Stuff has been examined, and found always of a Piece with what we have deſcribed.

By both theſe Inſtances I reckon it abundantly evident, that the villous Coat is in a very looſe and weakly State in ſome People of a weak Habit of Body, and actually caſts off, and that in ſuch Circumſtances the mildeſt Food and Liquors raiſe a conſiderable Smart in the Paſſage; and this, I think, may be allowed a Sign of ſuch a Diſpoſition: And I cannot but perſwade myſelf, if it had been duly attended to, we ſhould have had a ſhorter Catalogue of Medicines in the Claſs of the Correctors of the Humours, and much ſeldomer Indications for purging and vomiting in the ſcalding of the Stomach. It is true the Patient I laſt mentioned found the greateſt Relief in her ordinary Fits of Illneſs from the teſtaceous Powders, and, while under the *Dyſentery*, from drinking old defecated Lime-water prepared with *Guajac-wood;* but who would dream of an acid as the Cauſe of the Diſorder, when the baring of the Guts was ſo evident, where there was ſuch a Reſemblance between her Caſe and the firſt, where we were ſure that the pureſt Water immediately proved the *Stimulus*, and when the healing Virtues of the teſta-

ceous

ceous Powders and Lime-water are as conſpicuous as that of their being alcalies? I ſhall not ſay, but from a Defect of the oleagenous Slime which lines the Guts, ſomething of the ſame Symptoms may appear; but when the Senſe is ſo exquiſite, as in the two Caſes I have adduced, and ſo permanent, I would always ſuſpect ſome Part of the Coat itſelf to be abraded: And as ſuch a Senſe of ſcalding and Pain gives an evident Diagnoſtick of the Preſence of the Diſeaſe, ſo I reckon the paſſing *Mucus* an evident Demonſtration of it; and this happening daily without Pain in ſmall Globules in the Niches of the harder Excrement, as I have often obſerved, we muſt allow, that as the Scarf-skin daily rubs, or caſts off in dry Scales, ſo Parts of the cruſtaceous Coat ſeparates and caſts off inſenſibly according to your Suppoſition; and as I have ſeen it, and every one who will give themſelves the Trouble of obſerving, may ſee it under Conſtipation in the human Kind, ſo *Lewenhock* has been particular in examining it in a Variety of Brutes in a ſound State, as we find in his Letter to Dr. *Aſton*, *De muco inteſtinali*, in the firſt Volume of his Works. But then this, which he and I call *Mucus*, is moſt different from the ſlimy roping Humour often caſt up in vomiting, and which ſeems

ſeems to be a redundant Secretion of weakned or ſtimulated Glands or ſecretory Veſſels; for whereas this eaſily incorporates with Water, and has much of its Colour, the *Mucus* is of a greater Conſiſtency, lies in Parcels without mixing with the Humours, is of a whiter Colour, and truly vaſcular though tranſparent; ſo that I think for Diſtinction the other ſhould keep the Name of *Plegm* or *Pituit*, and this only that of *Mucus*; which is a Diſtinction I had not made fourteen Years ago when I printed my Diſſertations, otherwiſe I ſhould not then have called in queſtion what *Leweenhock* advances upon the Head, where he tells us, that the moſt obſcure Parts of the *Mucus* paſt in a ſound State, is really ſolid Portions of the Inteſtines and diſtinct Veſſels. They indeed differ much from the Veſſels we have deſcribed in our Hiſtory, and are exquiſitely leſs, as may be found from his third and fourth Figure of that Letter, where we have them greatly magnified; but as the *Mucus* in a ſound State is probably made up only of ſome of the finer Veſſels, ſo there is no Reaſon to doubt but that under Diſeaſes, when a greater Force acts upon theſe Parts, Veſſels of a very different kind may likewiſe caſt off: For, by the firſt of the Hiſtories I have given, we have

have a certain Instance, that in weaker People, long affected in these Parts, the whole Vessels passing the nervous Coat separate and cast off; and how various these are may be learned from *Ruysch*, *Sanctorinus*, &c. And by the second we see how a certain Set of Vessels separate from the rest, or rather keep intire, when these which had been involved with them are destroyed; which we can have no Difficulty to account for, when we find that by long drenching Parts of Animals and Plants in Water, we destroy the weaker and preserve the stronger Vessels: For thus in a general Dissolution of the soft, luxuriant Coat of the Intestines, the stronger Parts may discover themselves more distinctly than in any other Circumstances; and this Disposition to separate is probably acquired under a long bad Habit of Body, as in the first Example, or from the Constitution of the Season, which I reckoned to be the Case of the second joined with her Weakness, the Year 1739, wherein she suffered, being remarkable for its perpetual Moisture; by which, as there was a great Diminution of the Heat upon the Surface of the Body, and a relaxed State of the Solids, so the smaller serous Vessels would continue a great deal more loaded, and be distended, than in other Circumstances; for it is certainly

tainly in the human Body, as Mr. *Hales* obſerves in Plants, that the Courſe by the Roots is in proportion to the Diſſipation by Leaves, Fruit, Stem, *&c.* And *Hippocrates* obſerves, that a moiſt Winter or Spring produces *Dyſenteries* in the following Seaſons, ſuppoſe theſe ſhould be dry, as we find in the 11th and 12th *Aphoriſms* of his third Section: To me the Reaſon appears plain, their being long drench'd in Moiſture makes them weak, ſo that they are eaſily affected upon the ſwelling of the Humours in the raiſing Seaſons of the Year; which was certainly the Caſe with my Patient and many others that Year, wherein *Dyſenteries* were very common; but then as to the Fibres that diſcovered themſelves in ſo diſtinct a State, I muſt give it as my Opinion, that they were the ſame *Leweenhock* has deſcribed, *Figure* 7th of the Letter we have mentioned, where the Fibres are in their natural State, as he viewed them in a Variety of Subjects no way diſeaſed; and this may account for their not being ſo large as ours; and the viewing them as they lay in the Inteſtines, implicated with many other Veſſels, might prevent his ſeeing the leſſer Veſſels running between them, which the diſeaſed State of theſe Parts had given us Opportunity to ſee; though, when this inner

Coat

Coat is ſeparated, it is not always ſo prepared as to ſee the Courſe of any of the Veſſels concerned in it, as in theſe Caſes you mention where the whole Coat comes off in one Slough; a particular Inſtance of which we have in the 17th Obſervation of *Tulpius*'s 3d Book, like to which I had one communicated to me by Dr. *George Young*, where the Length of the tubular Membrane was half an Ell; a Piece of which dried I examined with a good Microſcope, but could not ſo much as obſerve any thing fibrous in it, all the Veſſels in it being promiſcuouſly adherent into one Scurf; and probably this may form in the Inteſtines, as the Calloſity forms in the Scarf-skin environing the Surface of the Body. The Doctor's Patient recovered very ſoon by the Uſe of anodyne Medicines, that gave the Parts Opportunity, without Diſturbance, to recover themſelves, as in our Patient they did by the Aſſiſtance of *Lime-water*, and as we ſee to happen very ſuddenly in *Dyſenteries*, where the greateſt Quantities of *Mucus* had been diſcharged; ſo that we have the moſt pregnant Proofs of the eaſy Renovation of this internal Coat. Nor will ſo quick a Renovation of this vaſcular Part appear ſtrange, when the Hiſtory of the *Placenta* is conſidered, as I gave it in the former Volume,

where I think we had some strong Arguments to convince us that the whole *Placenta*, which is one thick vascular Mass, was the Product of the delicate nervous *Chorion*; which we may consider in our present Comparison, answering to the *nervous Coat* of the Intestines: Nor can we reckon the Comparison forced, when we consider how much the pulpy unequal Surface of the one resembles the other, and how they are employed the same Way to draw up Juices for the Nourishment of the Body.

I shall conclude my Paper with observing, that in a great many I have opened dying of a *Volvulus*, I always found a strong Inflammation reaching at once the whole Coats or Thickness of the Intestines; in one I found more than a Foot of the *Ilium*, of as deep a red as Vermilion, forced within the *Cæcum* and *Colon*, lying upon the left Side, opposite to the Place the *Cæcum* lies for ordinary in the Right, stuffed hard together into the Bulk of my Fist; so that it required a considerable Force to unfold them. I found the *Cæcum* and most of the *Colon* in a second Body, stuffed together, tho' not so hard, and lying likewise upon the left Side. In a third I found four different Parts of the *Ilium* differently engaged; but the greatest was not

not above four Inches, though all greatly inflamed: So that the Inflammation would appear to me to be the original Diſeaſe, and to require large blooding, rather than ſtrong Purges or Quick-ſilver recommended by *Ruyſch, Theſ.* x. No. 62. both of which I reckon of the worſt Conſequence in ſuch a Caſe; though, when the Suſception takes place, the Caſe ſeems incurable, at leaſt to require more *Hippocrates*'s Remedy, the Bellows, than what works downwards.

LXVIII. *The* Ureters *obſtructed by ſmall Stones; by* Alexander Monro, *P. A.*

AN old Man who had ſuffered under ſome ſevere Fits of the Stone, ſeveral ſmall ones of which he had paſſed, and who afterwards had had violent Hæmorrhagies at his Noſe, recovered, in appearance, a very firm State of Health, without any Complaint, and enjoyed it a conſiderable Time. Being attacked with another Fit of the Gravel, and nothing being evacuated from the Bladder, except now and then a Spoonful of a clear limpid Liquor, which had neither Smell nor Taſte of Urine more than Serum of the Blood has, and no Diſtenſion of the

Bladder coming on, was blooded, purged, bathed, and all the other Methods practiſed in Obſtructions of Urine and Stone were employed in vain, the Obſtruction remained, he became comatous and died.

The left *Kidney* was conſiderably leſs than natural, and was become a thin Sac; the *Vreter* belonging to it was very ſmall, and felt hard; when cut open it was found fully ſtuffed with Gravel of a dirty black Colour, ſqueezed ſo cloſe together, that no Liquor had probably paſt that Way for a conſiderable Time.

The right *Kidney* was diſtended with Urine to a moſt monſtrous Size, and the *Vreter* was ſo large, that at firſt Sight I miſtook it for a Piece of Inteſtine. Upon opening it down to the Bladder I found a ſmall Stone, niched ſo firmly between the Coats of the Bladder, that I had ſome Difficulty to bring it out; it was not above a fourth of an Inch from the Orifice of the *Vreter* into the *Bladder*. Two of your Number were Witneſſes to what I have now related.

LXIX. *An*

LXIX. *An ESSAY towards the Diſcovery of a ſafe Medicine for diſſolving the Stone; by* ROBERT WHYTT, *M. D. Fellow of the College of Phyſicians at* Edinburgh.

Non fingendum aut excogitandum, ſed inveniendum. Bacon.

MRS. *Stephens*'s Medicines for diſſolving the Stone are ſo bulky and nauſeous, that ſome People cannot take them, and many uſe them with the utmoſt Reluctance; nay ſo great is the Difficulty attending a Courſe of theſe Medicines, that there have been not a few Inſtances of ſuch as, after taking them for many Months without any Benefit, have ſubmitted to be cut, rather than go on any longer with a Medicine ſo extremely nauſeous, and which had greatly increaſed their Pains without bringing any thing away (*a*).

Dr. *Hartley* (*b*) leaving out the ſuperfluous uſeleſs Part of her Compoſitions, has reduced them to 2 ½ Ounces of Soap, and 7 ½ Scruples of Egg-ſhell Powder, as the mean

(*a*) Dr. *Jurin*'s Caſe, p. 4 and 5.

(*b*) See his Supplement to the View of the preſent Evidence.

Doſe to be taken every Day; but the Powder is ſo nauſeous, and this Quantity of Soap is ſo great, that I ſuſpect we ſhall find few Patients who will continue to take the Medicines thus reformed by him for any conſiderable Time.

After reading the ingenious Experiments publiſhed laſt Year by the reverend and learned Dr. *Hales* upon Mrs. *Stephens*'s Medicines, I was led to think that Lime-water had as fair a Chance as any thing to diſſolve the Stone. For ſince it there appears, that the Soap owes its Virtues neither to the Potaſh nor Oil, but wholly to the Quick-lime that enters into its Compoſition; and as Mrs. *Stephens*'s Powder, which ſhe uſed long before ſhe gave the Soap in any Quantity (*a*), and which ſhe ſtill lays great Streſs upon, is no other than a Lime, it is very reaſonable to expect great Benefit from Lime-water, which has this further Advantage, that by its Means the Virtues of a greater Quantity of Lime may be ſafely conveyed into the Blood; for in Soap the Lime bears ſo ſmall a Proportion to the other Ingredients, that but a very inconſiderable Quantity of it can in this Form be mixed with our

(*a*) *Hartley*'s Supplement to the preſent View, p. 1.

our Fluids (*b*), and of the Powder (already half ſlack'd, and conſequently greatly weakned by being expoſed 60 Days to the open Air) only a few Scruples are exhibited a Day. If this Powder is ſwallowed without enough of Liquids along with it, it may be of bad Conſequence, and, I am afraid, has been the Occaſion of great Heat and Uneaſineſs in many People's Stomachs, and if it is ſufficiently diluted, it can have little other Effect than Lime-water. When to all this it is added, that Lime-water is found by

(*b*) In *England* they make Soap with a Lye of Potaſh and Quick-lime, boiled up with Fat and Oil to a proper Conſiſtence; and it is upon the Suppoſition of *Alicant* Soap being alſo made in this Manner that Dr. *Hales*'s Experiments moſtly proceed; for having found a Lye of Potaſh and Quick-lime, which is of a Nature moſt intolerably fiery and corroſive, to diſſolve the Stone more quickly than any thing except Spirit of Nitre, it was reaſonable to expect that Soap, of which this conſtitutes ſo conſiderable a Part, ſhould be poſſeſſed of a diſſolving Virtue likewiſe: But I have been informed by a Gentleman of undoubted Credit, who was at *Alicant* in *Valencia*, where the beſt Soap is made, that there is no Quick-lime at all uſed in its Compoſition, but inſtead of it only Lime-water, which, together with the alkaline Salt got from the Aſhes of the Herb *Kali*, and with Oil of Olives, is boiled in large Caldrons that hold ſeveral Tons, till it acquires a proper Thickneſs, when they pour it out on a Floor, and, before it hardens, cut it into Bricks. See alſo *Lemery*'s *Dictionaire de drogues*, p. 485. *Savon eſt une compoſition faite avec l'huile d'olives la plus groſſiere, de l'amidon, de l'eau de chaux, & de la leſſive tirée de cendres du kali. L'amidon*, the Starch, he tells afterwards, is only ſometimes added in order to make the Soap whiter, and turn ſooner thick.

Experience to diſſolve a Stone out of the Bladder, is it not reaſonable to expect, that when taken in large Quantities, and but little weakned by the drinking of other Liquors, the Urine may be ſo far impregnated with its Virtues, as to acquire likewiſe a Power of diſſolving the Stone?

But as hypothetical Reaſoning alone upon the Virtues of Drugs ſeldom proves ſatisfactory, I embraced the firſt Opportunity that offered to make a Trial of Lime-water, the Effects of which will beſt appear from the following Hiſtory.

Mr. *David Millar*, Maſter of the Grammar-ſchool of *Kirkaldy*, about 60 Years of Age, had been often diſtreſſed by Stones paſſing from the Kidneys to the Bladder ſince the Year 1704; ſometimes he has had ſevere Fits of Pain once or twice in a Year, and ſometimes but once in two or three Years, and theſe of two, three or four, and even of eight or fourteen Days Continuance; but always in a few Days after theſe Fits he voided Stones one or more, till *June* 1740, when, after a painful Fit of Diſtreſs and Sickneſs for two Days, the Stone arrived at his Bladder; but though he uſed his ordinary Means of riding, walking quick, jumping, and drinking plenty of proper Liquors to make it paſs, yet all his Endeavours were in vain.

For

For half a Year after this he was troubled with frequent Obſtructions in making Urine, although without any great ſtimulating Pain except in voiding the two or three laſt Drops. After this he thought he found the Stone increaſe, and become heavier in his Bladder, and ever ſince *March* laſt (1741) upon riding or walking a Mile or two, his Urine was always mixed with Blood; beſides, from the Beginning of *January* he had loſt all Power of retaining his Urine, ſo that it went from him every eight or ten Minutes, which was accompanied with great ſtimulating Pains, yet ſometimes with Intervals of Eaſe for a Day or two, after ſweating and keeping warm.

At firſt he drank Milk and Water, but in *May* laſt (1741) he began to take Soap, firſt to the Quantity of half an Ounce every Day, which in the End of *July* he increaſed to an Ounce, and in the Beginning of *September* to near an Ounce and a half; but all this without any ſenſible Relief, his Pain, bloody Urine, and Inability to retain his Urine, ſtill continuing as before.

In the End of *September* I adviſed him to drink with the Soap large Quantities of Lime-water, beginning with one Pound, and gradually increaſing the Quantity to three Pounds a Day, and at the ſame time to drink

no

no more of any other Liquors than was neceſſary to quench his Thirſt.

Within four or five Days after he began to drink the Lime-water, he recovered in a great Meaſure the Power of retaining his Urine; and from that Time had leſs Pain and leſs bloody Urine upon uſing Exerciſe than formerly; ſo that on *November* 13th, although he walked upwards of ſix Miles pretty quick, yet he retained his Water for nine or ten Hours together; and as he voided it with little or no Pain, ſo he found no Blood mixed with it.

November 15th at Night, when going to Bed, and trying to make Water, he found a Stone entring the Beginning of the *Urethra* and obſtructing it, which it continued to do all Night; he ſlept little, and often attempted to urine, but could not, unleſs a very little, and that Drop after Drop. Next Morning, when he was putting on his Clothes, finding an Inclination to urine, and endeavouring it with all the Force he could, he voided a ſmooth Stone about the Bulk of a common Bean, of a whitiſh waſhed Colour, whereas all thoſe he had paſſed formerly, were of a brown Colour and rough; it appeared plainly to be a part of a larger Stone.

Upon the 17th of *November* he walked up-

upwards of two Miles without any Pain or bloody Urine.

November 18th, After making Urine, he felt ſomething at the Neck of his Bladder, occaſioning a ſlight obtuſe Pain, which he took to be another Stone.

From this 'till the Beginning of *December* he was very eaſy, not having been obliged, above three or four Times a Day, to make Water, which was never mixed with Blood, nor attended with thoſe ſtimulating Pains he formerly had; only twice or thrice he found his Urine ſuddenly ſtop, when he was voiding it, and once he thought a Stone was entring the Paſſage, which a little after fell back into the Bladder; when he ſtumbled or ſtept down a Stair, he ſtill felt ſomething heavy that puſh'd or touched him in the under Part of the Bladder; his Urine during all this time had a great deal of white Sediment, and ſome browniſh Flakes among it, but he was ſo much abroad about his Buſineſs, that he could not get any regular Obſervations made upon it.

Upon *Thurſday* Night, the 3d of *December*, the Stone which he ſuppoſed to have been ſtill in his Bladder, entred the Beginning of the *Urethra*, where it ſtuck till *Monday* Morning following, during which time his Urine was very much obſtructed, coming

coming away in Drops, or in a very ſmall Stream, with a good deal of Uneaſineſs and Pain: From this to the End of *December* he was often in the ſame Condition, the Stone ſticking in the Paſſage ſometimes half a Day, ſometimes a whole Day and a Night, and then falling back into the Bladder; but all theſe Times he never had any of thoſe piercing ſtimulating Pains which he was wont to feel, before he uſed the Lime-water, in paſſing his Urine, and eſpecially after the laſt Drops; and now alſo he was able to retain it half a Day, and then void it without Pain. Immediately after emptying his Bladder, he always ſenſibly perceived the Weight and Preſſure of the Stone, if he but walked a little, but when there was any Quantity of Urine in it, this became leſs perceptible; he concludes a Letter to me at this time, with theſe Words, *As I have hitherto enjoyed a good Degree of Health, ſo now I am eaſy beyond Expectation, which makes me think the Stone in a diſſolving State, and that its Surface is very much ſmooth'd. I continue uſing the* Soap *and* Lime-water *daily; which laſt I frequently take to my Meat, inſtead of other Drink, and I think my Urine taſtes a little of it.*

On *Monday, January* 4th 1742, at Night, he

he found a Stone had got into the Beginning of the *Urethra*, which in a good Meaſure hindred him from voiding any Urine; however, next Morning, after a good Sleep it came away; it is larger than the one he paſſed before, and is evidently a Piece of the ſame Stone.

For ſome Days after paſſing this Stone, he found the *Urethra* very tender, and a little pained, which occaſioned his making Urine more frequently than uſual; but this ſoon went off, and ever ſince, to uſe his own Words, he has been perfectly free of all Pains and Symptoms of the Gravel, and as eaſy in that Reſpect as ever he was in his Life; and, upon the whole concludes, That he received more Benefit from the Lime-water, than any thing he ever uſed, and to it chiefly aſcribes what has happened above.

As Authors have ſometimes been accuſed of framing Hiſtories to ſupport a certain Theory, or raiſe the Value of ſome favourite Medicine, I thought it might be proper to add the Gentleman's own Atteſtation of the Truth of what has been above related.

Kirkaldy, June 1. 1742.

Having read the Hiſtory of my Caſe drawn up by Dr. Whytt, *I do here, for the Satisfaction of the Publick, declare, that*

that it is in every Particular agreeable to Truth, and that at preſent I am as perfectly free of all Symptoms of the Gravel as ever I was in my Life.'

Da. Millar.

Upon this Hiſtory it is natural to obſerve.

1. That from the Figure and Shape of the Stone firſt paſſed, it evidently appeared to be a Fragment of a larger one, that had lain in the Bladder for about ſeventeen Months, but then was broken, and in ſome Degree diſſolved, and as of this no other Cauſe can be aſſigned, but the *Soap* and *Lime-water*, 'tis but reaſonable to aſcribe it to their Efficacy. That part of the Stone where it has been broke off, has its Edges ſo ſharp, while every where elſe it is ſmooth and rounded, and a red *nucleus* ſo plainly appears in the middle of it, that no reaſonable Doubt can be had of its being Part of a larger Stone: But this is put beyond all Queſtion by the Stone laſt paſſed, which tallies pretty exactly with the former, is evidently of the ſame Texture, and the two together, excepting a ſmall Deficiency at one End, ſeem to make up a complete Stone. Whether what is wanting has paſſed in Fragments unobſerved, or if it has come away quite diſſolved in Flakes and white Sediment, is not ſo certain. Beſides

ſides, as he has had no Stones paſſing from his Kidneys to his Bladder ſince *June* 1740. if we deny theſe Stones to have been one, we muſt ſuppoſe them lodged 18 Months in the Bladder, without either acquiring a greater Bulk, or ever endeavouring to paſs, none of which are at all likely.

2. The Surfaces of the Stones ſhew them to have been in a diſſolving State; there are Fibres like Roots which run along them, in ſome Places plainly broken off, and the hollow Furrows they had made ſtill remaining; and as the *Lime-water* and *Soap* had longer time to act upon the ſecond Stone, ſo we find ſtill more evident Signs of Diſſolution about it; it has in moſt Places a very rotten Appearance, and in ſome is eaten ſo deep, that one can ſee ſeveral of its concentrick Layers. Further, as Dr. *Hales* has obſerved (which will more fully appear in the following Experiments) that the *Calculus* generally turns white in diſſolving, the whitiſh Colour of theſe makes it probable they were in a diſſolving State.

3. It does not appear that the Soap alone had any great Influence in this Caſe, for although from the End of *July*, till about the 8th of *September* he took an Ounce every Day, and after that near an Ounce and a half, yet he found no ſenſible Relief, which

which probably might be owing to his not taking it in ſo large Quantities as ſome others have done (*a*).

4. It would ſeem that *Lime-water* has a very uncommon Efficacy in eaſing the Symptoms and probably diſſolving the Stone in the Bladder; for in five Days after Mr. *Millar* began to drink it, he was able to retain his Urine better than he had done for eight or nine Months before, and found the ſtimulating Pains in making it leſs, and the Quantity of Blood in it ſenſibly to diminiſh; ſo that upon the 13th of *November*, altho' he walked ſix Miles pretty quick, he had none of it, nor has had ever ſince; and on the 16th of the ſame Month (having uſed it little more than ſix Weeks) he paſſed the firſt Stone. Nor is it at all unreaſonable to ſuppoſe that *Lime-water* may have a greater Effect in diſſolving the Stone than *Soap*, ſince we find it poſſeſſes a greater diſſolving Vertue out of the Bladder. *See Experiments below* No. 11. *compared with* No. 70.

That the *Lime-water*, from its Aſtringency and ſtrengthening Quality ſhould have a more ſudden Effect in curing the Incontinency of Urine, than the Pain and Blood that

(*a*) The mean Quantity ordered by Mrs. *Stephens* is 2 $\frac{11}{22}$ Ounces.

that, upon Motion, generally accompanied it, is eaſily accounted for, ſince as the two laſt proceeded chiefly from the rough Sides of the Stone grating upon, and tearing the Blood-veſſels on the internal Coat of the Bladder, this muſt in part have continued to happen, till the Points were worn off its Surface, and accordingly we find the firſt Stone was pretty ſmooth when he voided it; but, beſides this, after the Stone once begins to diſſolve, its Surface is either covered with a whitiſh *mucus*, or ſoft rotten Scales or Layers, which are thrown off one after another, *Vid. Exper. below.*

5. It may not be amiſs to take notice, that altho' Mrs. *Stephens*'s Medicines almoſt always occaſion great Pain and Heat of Urine for ſome Weeks, or even Months after firſt taking them (*a*), yet the *Soap*, in the Way Mr. *Miller* took it, gave him no ſuch Uneaſineſs; and the *Lime-water* had ſo very contrary an Effect, that in a few Days it relieved ſome of his Complaints, and abated others: As the Pain and Heat of Urine in taking theſe Medicines ſeem chiefly owing to the Alkaline Salt which bears ſo great a Proportion in the Compoſition of the *Soap*, is it not probable that it was, by beginning

(*a*) See Dr. *Hartley*'s View of the preſent Evidence, *&c.* and Dr. *Kilpatrick*'s Caſe, written by himſelf.

to take the *Soap* in very ſmall Quantities, and gradually increaſing the Doſe, as well as never taking ſo much of it as is ordered by Mrs. *Stephens*, that Mr. *Miller* eſcaped this Complaint?

Finding his Stomach unable to bear the *Soap* in Decoction, he took it every Morning in Subſtance only ſliced down, and found it agree very well with him, excepting a little of the Heart-burning, which it ſometimes occaſioned; and the *Lime-water* and it, were ſo far from having any bad Effect upon his Health, that he rather found himſelf eaſier and lighter, and conſiderably freer of ſome kind of Lowneſs of Spirits he had before laboured under.

6. As for theſe four Months paſt, he has been quite free of all his former Complaints, ſo there is no Reaſon to doubt of the Stone which gave him ſo much Uneaſineſs, being intirely brought away; for if any conſiderable Part of it remained, I can't ſee why he ſhould not ſometimes after making Urine feel it in his Bladder, as he almoſt always did before paſſing the laſt Stone.

By this Succeſs of the *Lime-water*, I was induced to make the following Experiments, with a View to a further Diſcovery of its Nature and Virtues.

SECTI-

SECTION I.

Experiments on Quick-lime.

1. MALT SPIRITS poured upon a Piece of burnt Lime-ſtone, are plentifully abſorbed by it, without any ſenſible Ebullition, (ſome Air-bubbles excepted, that ariſe from its Surface) nor does it ſlack, but after lying a great many Hours among them.

I immerſed a Piece of Quick-lime in rectified Spirit of Wine, in a cloſe Bottle, which, after eight Days ſcarce ſhew'd any Appearance of ſlacking.

2. Vinegar is ſomewhat more plentifully abſorbed by Quick-lime than Spirits, with a good many Air-bubbles, and hiſſing Noiſe at firſt, which however ſoon ceaſes, and if freſh from the Fire, it will ſcarce ſlack, unleſs allowed to continue many Hours among it.

Water, whether cold or hot, poured upon Quick-lime that has lain ſometime among Spirits or Vinegar, produces no Ebullition, except a very few Air-bubbles at firſt; and the Stone that has been in the Vinegar is longeſt of ſlacking.

3. Upon putting a Piece of Quick-lime in Claret Wine, a conſiderable Ebullition imme-

diately happens; but in twenty four Hours the Stone is ſcarce diſſolved.

4. Oil is plentifully imbib'd by Quick-lime without any Ebullition or Heat; if there is any Rent in the Stone, a few Air-bubbles will ſometimes riſe out of it; when put in boiling Water after this, a good many Bubbles of Oil riſe from the Surface of the Stone, and after ſeveral Hours ſtanding it begins to melt down into a ſoft, fat, argillaceous Subſtance.

Hence it would ſeem that Oil, by ſheathing the fiery Particles in the Lime, deſtroys their Efficacy, ſo as to hinder their Ebullition with Water, as on the other Hand, its Nature is ſo far changed, as to become miſcible with Water.

5. A Piece of Quick-lime being put in briſk ſtrong Ale, a good many Air-bubbles immediately aroſe with ſome Noiſe; but this was quickly over: After twenty four Hours one third of the Stone was not ſlack'd.

Small Beer has much the ſame Effect, only the Ebullition is greater, and laſts longer.

Water, whether cold or hot, poured upon a Piece of Quick-lime that has lain ſome time in Ale or Beer, producesno Ebullition, nor eaſily diſſolves it.

6. The Heat or Cold produced by the Mixture of the above Liquors, with pow-

dered

dered Quick-lime, I found to be as follows.

When Quick-lime was mixed with Lamp-Spirits, the Thermometer in two or three Minutes fell from 54 to 53 Degrees.

With Vinegar it roſe in five Minutes from 52 to 68 Degrees, after which it began to fall.

With Claret it roſe, in ſix Minutes, from 51 to 56 Degrees.

With ſtrong Ale it roſe, in ten Minutes, from 48 to 57 Degrees.

With Cold Water it roſe, in 22 Minutes, from 48 to 112 Degrees, and then began to fall (*a*).

7. Ten times its Weight of hot Water being poured upon freſh burnt Lime-ſtone there immediately ariſes a great Heat and Ebullition, which laſts a conſiderable Time, when this is over, the Lime falls to the Bottom, and the clear Water above, being filtrated through brown Paper, is that which I made uſe of in the following Experiments: The Proportion of 8 to 1 ordered in the *Edinburgh* Diſpenſatory, ſeems rather too ſmall, and affords but very little Water, if the Lime-ſtone be well burnt, and freſh from the Fire;

(*a*) The Quantity of Quick-lime uſed in this Experiment was very ſmall, otherwiſe the Thermometer ſhould have riſen much higher, ſince Quick-lime frequently makes cold Water boil.

nor have I been able to observe any considerable Difference in the Strength of the Lime-water made with these different Proportions.

Cold Water being added to Quick-lime, soon produces a considerable Heat and Ebullition, and the Water got off it, has the same Virtues as the above.

SECT. II.

Experiments with Lime-water *upon* Urine.

As the calculous Concretions of the Kidneys and Bladder are generated by the Urine, and owe their Growth entirely to a constant Apposition of Particles derived from that Fluid, I thought it might be worth while, before making any Experiments on the *Calculus*, to try the Effects of *Lime-water* upon *Urine* and its *Sediment*

8. If an Ounce and a half of Lime-water be added to an Ounce of fresh-made Urine, it immediately loses its yellow Colour, and becomes whitish and turbid; and, in a little Time, a light white Sediment falls to the Bottom, leaving the Liquor above perfectly pellucid, of a fine light Limon-colour (*a*), with-

(*a*) This, as well as the Quantity of white Sediment, varies according to the Strength of the Urine.

without any Scum or Cruſt on the Sides of the Glaſs.

N. B. Lime-water does not raiſe any ſtrong fiery Smell when mixed with Urine, nor does the Mixture effervesce with Acids (*a*).

9. I let ſome freſh Urine ſtand by itſelf in a Glaſs about forty eight Hours, in which time it had depoſited a rediſh brown Sediment upon the Bottom of the Glaſs, with a Cruſt of the ſame Nature upon its Sides; I then decanted off the clear Urine, leaving the Sediment and Cruſt alone, and filled up the Glaſs with Lime-water, upon which the Sediment immediately roſe from the Bottom, loſt its Colour, and the Mixture became white and turbid; the Cruſt on the Sides of the Glaſs quickly diſappeared; and in a ſhort time a large light white Sediment fell to the Bottom, which tho' allowed to ſtand thirty Hours, did not in the leaſt adhere to, or leave any Cruſt upon the Bottom or Sides of the Glaſs.

Having poured off what was clear, I added ſome White-wine Vinegar to this Sediment, upon which it immediately diſappeared, and the Liquor became pretty clear, not unlike Sherry, which however after ſome Hours let fall a dark-coloured Sediment.

a Hence

(*a*) See Numb. 60. below.

α Hence we ſee that Lime-water has not only a Power of hindring the Urine from reſolving into theſe Principles, which are imagined to give Riſe to the Stone, but alſo of deſtroying and changing their Nature after they are ſeparated from it; from which ariſes a ſtrong Probability, that it ſhould not only hinder the Generation of the Stone in the human Body, but diſſolve it after it is formed: Nay, although it ſhould be allowed that Lime-water may in a great Degree loſe its diſſolving Power before it arrives at the Bladder, yet if it ſhall, by deſtroying the petrifying Quality in the Urine, hinder any new Accretions to the *Calculus*, this muſt neceſſarily in time have its Surface waſhed down and worn away by the Urine continually running along it, and the Coats of the Bladder acting upon it, as we find even the hardeſt Rocks yield to common Water, according to the old ſaying, *Gutta cavat lapidem*, &c.

β Do not theſe Experiments afford us a clear Reaſon why the Stones which Mr. *Miller* paſſed after drinking the Lime-water were of a whitiſh Colour, whereas all that he had voided for thirty Years before, were browniſh? And does it not ſeem probable that the great Quantity of white Sediment in the Urine of ſuch People as have

taken

taken Mrs. *Stephens*'s Medicines has been owing to the Lime in them? For we find Lime-water produce that Sediment in Urine out of the Bladder, and by drinking Lime-water Mr. *Miller*'s Urine depoſited it in great Abundance; the Quantity of this however will be increaſed by what is daily waſhed off the Surface of the Stone by the Efficacy of the Medicines.

Does it not likewiſe appear plain from theſe Experiments, why Dr. *Jurin*'s Urine (*a*) (eſpecially after his largeſt Doſe of *Soap-lees*) was whitiſh and turbid when he firſt made it, and afterwards depoſited a *calcarious* Sediment, as he calls it, but which, notwithſtanding the Opinion that has hitherto prevailed of its being furniſhed in a good Meaſure by the Medicines (*b*), ſeems only to be owing to the Change made by the Lime upon the Sediment of the Urine. And that Lime-water not only changes the Colour of the Urine, but of the Surface of the *Calculus* itſelf, plainly appeared in a Stone (taken from the Body of *John Greig* who in *December* laſt died in the Royal Infirmary of an Iliack Paſſion) which had its external Surface almoſt intirely white and a little rotten, while within it was of a ſandy

(*a*) Jurin's Caſe, p. 12.
(*b*) Hales's Experim. p. 12.

ſandy Colour. Of this no Reaſon could be aſſigned but his having drunk Lime-water for eight Days, to the Quantity of about an *Engliſh* Pint a Day; and it is obſervable, that as he left off the Lime-water eight or ten Days before his Death, ſo in ſome Places there was a browniſh Cruſt beginning to grow over the white Surface.

SECT. III.

Experiments with Lime-water upon the Calculus.

In the following Experiments I made uſe of two *Calculi*.

The firſt, which for Brevity I ſhall denote by *A*, was given me by my ingenious Friend Mr. *Monro*, Profeſſor of Anatomy in this Place, it was of a cloſe Texture and very hard, and of a gray ſandy Colour.

The ſecond, *B*, was the one which I juſt now mentioned to have been taken out of *John Greig*'s Bladder; it ſeem'd fully as hard as the former, and was capable of receiving a Poliſh almoſt like Marble; it weighed an Ounce and a half, and its ſpecifick Gravity was to that of Water, as 1704 to 1000; its Colour was pretty much the ſame with the former.

10. A Fragment of *A* weighing 23 Grains, being put in Lime-water, and kept in a moderate Heat, was moſtly all rotten and diſſolved in little more than thirty Days.

11. A Fragment of *B* weighing 10 Grains, after two Days and nine Hours warm Digeſtion in Lime-water, had two Grains of its Subſtance rotten and diſſolved.

12. Some Lime-water that I made by ſlacking Quick-lime with boiling Lime-water, diſſolved a Piece of *A* of five Grains in about ſeven Days.

13. A Fragment of *A*, Gr. vi. after ſeventeen Days cold Digeſtion in Lime-water in *February* laſt, had loſt none of its Weight, nor was its Surface very ſenſibly ſoftened, although it had ſomewhat of a rotten Appearance, while a Piece of *B* of 12 Grains, in ſix Days cold Maceration in the End of *May*, had 2 ½ Grains of its Weight diſſolved.

From this Experiment, together with No. 20 and 57 below, one may be able to account for Dr. *Lobb*'s having found Lime-water to have no Power of diſſolving the Stone (*a*); for if the Lime-ſtone uſed in making the Water was not freſh from the Fire (*b*), and

(*a*) Treatiſe of Diſſolvents of the Stone, p. 326.

(*b*) That this was the Caſe is highly probable, ſince he made his Water with unſlack'd Lime, which he in the next Paragraph tells us was Lime a little ſlack'd.

and if the Experiment was made in an open Veſſel, and in the Winter-ſeaſon, it is no great Wonder if even, after a cold Maceration of twelve Weeks, there was no Appearance of Diſſolution about it.

Having thus found a conſiderable Power of diſſolving the *Calculus* in Stone-lime-water, I thought it might be worth while to ſee if Animal-lime had the ſame Virtue, and whether in a greater or leſſer Degree.

14. A Piece of *A* weighing nine Grains, was diſſolved by lying ſeventeen Days in Lime-water made with calcined Egg-ſhells, in a digeſting Warmth; and this, I am apt to think, might have happened ſome ſooner, had the Shells been more carefully calcined.

15. A Fragment of *A* of ſix Grains was, by two Days warm Digeſtion in Lime-water made with Oiſter-ſhells, reduced to two Grains, and in three Days to leſs than one Grain.

16. A Piece of *B*, eight Grains, in 36 Hours Digeſtion in Oiſter-lime-water, had about 3 $\frac{1}{4}$ Grains of its Subſtance diſſolved.

17. Having calcined a few Cockle-ſhells, that had lain long expoſed to the Weather, I put a Piece of *B*, eight Grains, in ſome of the Lime-water made with them, which in 36 Hours warm Digeſtion loſt near 3 $\frac{1}{2}$ Grains.

The

The Lime-water, eſpecially that from Shells, generally diſſolves the Stone by making it throw off white rotten Cruſts or Scales, which, if allowed to ly long enough among the Water, and if the Glaſs be ſhaken now and then, are reduced to a ſort of white *Mucus*, reſembling in ſome Degree the white Sediment of No. 9. but which, when dried, has the Appearance of a fine Lime: Upon adding Vinegar to this white *Mucus*, it loſes in a Day or two its white Colour, and acquires much ſuch an one as the *Calculus*, of which it was a Part, has when reduced to a Powder; which further ſhews, that the white Sediment in the Urine, as well as the white *Mucus* here, is not derived from the Lime, but wholly from the Parts of the Stone, and groſſer Parts of the Urine, thus changed by the Lime-water (*a*).

18. A Piece of *A*, ſix Grains, was rendred pretty ſoft, and intirely rotten, by a cold Maceration of ſeventeen Days in Oiſter-lime-water, in *February* laſt; but *May* 19th, having infuſed cold a Fragment of *B*, eleven Grains, in ſome of the ſame Lime-water, it loſt in three Days near five Grains, and in eight Days was reduced to a *Nucleus*, weighing three Grains.

From theſe Experiments it appears, that Oiſter

(*a*) See No. 9 above.

Oiſter and Cockle-ſhell Lime-water poſſeſſes a much greater Power of diſſolving the *Calculus*, than that of Stone-lime; nor is this laſt only inferior in its lithontriptick Virtue, but alſo as it is leſs homogeneous and ſafe, ſince the Lime-ſtone may be impregnated with metallick or mineral Principles, which even the Fire may not be able wholly to deſtroy.

19. In order to know what Proportion of Water was beſt to be added to the Shell-lime, I poured 21 Ounces of boiling Water upon three Ounces of freſh calcined Oiſter-ſhells, reduced to a groſs Powder, and in a little a great Ebullition enſued, which laſted a conſiderable Time. A Piece of *B*, 31 Grains, by lying 36 Hours in this Lime-water, with a Heat betwixt that of the human Body and melting Wax, loſt ſeven Grains of its Weight.

Having added 25 Ounces of boiling Water to 2 ½ Ounces of the ſame calcined Shells, there did not happen any ſuch ſtrong Ebullition as before, only a Noiſe at the Bottom of the Veſſel, and ſome ſmall Agitation in the Liquor, ſuch as commonly is to be obſerved in Water before it begins to boil. A Piece of *B*, 31 Grains, being kept 36 Hours in this Lime-water in the above mentioned Heat, loſt only five Grains.

To

To make therefore Lime-water with Oiſter or Cockle-ſhells, the Proportion I would recommend is 7, or at moſt 8 *lib.* of Water to one of calcined Shells (*a*); nor is there any Danger in the Strength of Lime-water made in this Manner; for I have lately ordered four *Engliſh* Pints of it to be drunk by a Man, and two by a Boy of eight Years of Age, every Day without any Inconveniency.

The Shells will calcine in any Fire, provided it be hot enough, and the Cockle and Oiſter with much leſs Trouble than the Egg-ſhells; if they are friable, and quite white, they are ſufficiently burnt; but if blackiſh or grey, they muſt be put to the Fire again.

If cold Water be poured upon Shell-lime, very little Heat or Ebullition enſues; yet the Water got off it ſeems to have as great a Power of diſſolving the Stone, as when made with boiling Water, but is more harſh and diſagreeable, the other having a Softneſs and Sweetneſs which this wants.

The Water, whether cold or hot, ſhould be allowed to ſtand four or five Hours upon the Shells, or longer, if a great Quantity is made at once.

20. I

(*a*) An earthen Veſſel is preferable for this Purpoſe to a wooden or Copper one, as the firſt will probably give it a bad Taſte, and the ſecond poſſibly a worſe Quality.

20. I infuſed a Fragment of *B*, ſeven Grains, in ſome Lime-water made with Oiſter-ſhells, that had lain 35 Days in the open Air after calcining, which being kept in a moderate Heat for four Days, had only about three Grains of its Subſtance rotten and diſſolved; whereas a Piece of *B*, eight Grains, by digeſting three Days and twelve Hours in lime-water, made with Shells freſh from the Fire, loſt about ſix Grains; nay I have obſerved, that after the Shells have been but fifteen or twenty Hours from the Fire, they neither make ſuch an Ebullition with the Water, nor have ſo great diſſolving Power, as when juſt taken warm from it.

I have made Experiments with Lime-water and ſeveral other Stones, but have never yet met with any that were able to reſiſt the Oiſter or Cockle-ſhell Lime-water, although ſome that were extremely hard, and of a dark brown Colour, diſſolved a good deal ſlower than either *A* or *B*.

As the calculous Concretions of the Urine have been thought to have ſome Analogy to the tartarous Cruſt left by Wine upon the Sides of the Cask, it may perhaps be worth while to obſerve, that Lime-water diſſolves *Tartar* pretty quickly, only, as its Virtue is ſoon deſtroyed by the Acidity of

of the *Tartar*, it muſt be frequently renewed upon it.

SECT. IV.

Experiments with Lime-water *and ſome of the* animal Humours.

THE great Power of Lime-water to diſſolve the *Calculus*, being ſufficiently made out in the above Experiments, the next Subject of Enquiry ſeemed to be, how far the Nature of Lime-water would be changed by mixing with the Humours of our Body, and conſequently what Probability there was of its carrying its Virtue along with it to the Bladder.

21. I infuſed a Piece of *B*, three Grains, in a Mixture of *Saliva* and Oiſter-lime-water, in the proportion of one of the former to two and a half of the latter, its Surface in a few Hours began to turn white, and, upon ſhaking the Glaſs, threw off white Scales, and in two Days warm Digeſtion it was reduced to a Grain and a half.

22. I immerſed another Fragment of *B*, three Grains, in an Ounce of *cyſtick Bile*, and three Ounces of Oiſter-lime-water, which being kept in a moderate Heat 42 Hours, had near one Grain and a half of its Sub-

ſtance diſſolved in the Form of thin whitiſh Scales.

23. I put alſo a Piece of *B*, five Grains, in a Mixture of one Ounce of freſh Urine, and three Ounces of Oiſter-lime-water, after digeſting three Days in the ſame Heat with the laſt, its Surface was become all over white, about a Grain of it was diſſolved, and the reſt ſomewhat rotten and friable.

Since from theſe Experiments it appears, that the animal Humours have nothing in their Nature peculiarly deſtructive of the diſſolving Quality of Lime-water, we might reaſonably conclude *à priore*, that it ſhould carry its Virtue along with it, even to the Bladder, and ſo in time diſſolve the Stone.

SECT. V.

Experiments with Lime-water, *and* fermented Liquors *and* Spirits.

HAVING ſhewn the Probability there is that the animal Fluids will not deſtroy the Virtue of Lime-water, we come next to enquire how far it may be affected by ſuch Liquors as are moſt commonly made uſe of in this Country.

24. *Claret Wine* deſtroys the Taſte of near double its Quantity of Lime-water, and the

the Liquor has the Colour of the Wine rather heightned, and the Taſte of Wine and Water; but, upon adding a little more Lime-water, it acquires a blackiſh Colour, not unlike Gun-powder, and begins to diſcover a little of the Taſte of the Lime. The Quantity required to produce this Change of Colour in the Claret varies according to the Strength of the Lime-water. Having once ſlack'd ſome Quick-lime with boiling Lime-water, I found that the Water got off it turned Claret black, when mixed with it in the Proportion of 1 $\frac{1}{2}$ to 1.

I took two Pieces of *A*, each weighing 23 Grains; the one being put in Lime-water, and kept in a moderate Heat, in five Days had near five Grains rotten and diſſolved; the other being put in one Part Claret and two Parts of the ſame Lime-water, and kept in the ſame Heat for fifteen Days, loſt nothing of its Weight, nor was its Surface at all ſoftned.

25. An Ounce of Lime-water mixed with an equal Quantity of *ſtrong Ale*, not in any Degree Stale, having been but fourteen Days in the Bottle, had its Taſte quite deſtroyed, at the ſame time that it weaken'd the malty Taſte of the Ale more than an equal Quantity of common Water. A Piece of *A*, ten Grains, after ſtanding thirteen

Days in this Mixture in a moderate Heat, had loſt nothing of its Weight, nor were there any Signs of Diſſolution about it.

Small Beer has the ſame Effect, but in a leſs Degree.

26. Upon mixing Lime-water and *Vinegar*, there does not ariſe any Effervescence or Ebullition, one Ounce of the latter deſtroys the Taſte of ten or twelve of the former; and a Fragment of *A* that weighed four Grains, after lying eight Days among this ſaturated Mixture in a digeſting Heat, had loſt nothing, nor was it any way ſoftened.

Hence it ſeems proper for ſuch as uſe Lime-water, to abſtain not only from all Acids, but alſo from Wine, Ale, and, ſo far as I have been able to obſerve, all fermented Liquors: And doubtleſs Mrs. *Stephens*, by ordering her Powder to be taken in a Teacupful of white Wine, Cyder, or ſmall Punch, muſt have greatly impaired the Strength of it, and rendred it much leſs effectual (although leſs offenſive to the Stomach) than otherwiſe it would have been.

27. A Spoonful of *Weſt-India Rum* mixed with the ſame Quantity of Lime-water, produces a Liquor of a fine Limon Colour, both taſting and ſmelling ſtrong of the Lime; a little Vinegar added to this immediately changes

changes its colour, and deſtroys all Taſte of the Lime.

28. *Rum*, in which ſo much *Limon-rhind* had been infuſed, as to give it a yellow Colour, being mixed with an equal Quantity of Lime-water, acquired a ſtronger yellow colour, but immediately became turbid, owing, I ſuppoſe, to the Change made by the Action of the Lime-water upon that Oil with which the Limon-skins abound, and to which the yellow Colour of the Rum was owing.

29. Equal Parts of *French Brandy* and Lime-water produce a Liquor higher coloured than the Brandy was before, but taſting ſtrong of Lime; in an Hour or two there falls to the Bottom a brown Sediment, (eſpecially if the Brandy was high-coloured) and the Liquor above becomes of a Limon Colour, not taſting of Lime; but when the Sediment is ſtirred up, it taſtes as before.

Much the ſame thing happens to *Malt-ſpirits* and *Rum*, when mixed with Lime-water, and in proportion as theſe Spirits are more or leſs free of Colour, ſo is the Sediment that falls to the Bottom. From this we ſee, that though theſe Spirits do not deſtroy the Taſte of the Lime-water, yet they have a Power of making the Lime precipitate in a ſhort time, which, when it falls to

the Bottom, carries along with it whatever is mixed with theſe Spirits in order to colour them.

30. Having infuſed a Piece of *B*, two Grains, in one Part *Malt-ſpirits*, and two Parts Oiſter-lime-water, in 35 Hours warm Digeſtion its Surface was become white, and it had about $\frac{1}{3}$ Gr. of its Subſtance diſſolved.

From theſe Experiments we may conclude, that if ſuch Perſons as drink Lime-water, cannot confine themſelves to watery Liquors, it will be ſafer to allow them a little weak Punch made without Sowring, than Wine, Ale, or any fermented Liquors.

SECT. VI.

Experiments with Lime-water *and* animal Food, *alſo* Milk, Honey *and* Sugar.

31. I put a Piece of *B*, ſix Grains, in a Mixture of one Part *Broth of Mutton*, and two Parts Oiſter-lime-water, which by three Days warm Digeſtion had two Grains of its Subſtance diſſolved.

32. At the ſame time having added half an Ounce of a ſtrong Decoction of freſh *Cod-fiſh*, to an Ounce and a half of Oiſter-lime-water, I immerſed in it a Fragment of *B*,

B, four Grains, which in the ſame Heat was in three Days and twelve Hours reduced to one Grain.

Hence we may conclude, that animal Food may be allowed to ſuch as are under a Courſe of Lime-water for the Stone.

33. A Fragment of *B*, near five Grains, being laid in a Mixture of one Ounce of *Milk*, and four Ounces of Oiſter-lime-water, after digeſting 42 Hours in a Heat rather greater than that of the human Body, had ſome of its Subſtance diſſolved under the Appearance of white Scales, and the greateſt Part of it was become rotten, ſo as to crumble down upon preſſing it with one's Nails.

34. Having diſſolved two Drams of *Honey* in three Ounces of Oiſter-lime-water, I digeſted in it a Piece of *B*, five Grains, 56 Hours in a moderate Heat; it loſt only one Grain of its Weight, and what remained was as hard as ever.

35. I immerſed a Piece of *B*, Grains 5, in three Ounces of Oiſter-lime-water, in which was diſſolved two Drachms of white *Sugar*; in 48 Hours warm Digeſtion, it was reduced to three Grains, and what remained did not ſeem quite ſo hard.

Thus it appears that *Honey* deſtroys in a good Meaſure the diſſolving Virtue of Lime-

water, while the same Quantity of *Sug* weakens it but very little. As in mixi Lime-water and Honey together, a pret disagreeable Smell arises, they seem to suff some Change in their Nature, by which t Virtue of the Lime-water is much weaken This may be also in part occasioned by t active Particles of the Lime-water being i viscated and sheathed by the balsamick Pa of the Honey.

SECT. VII.

Experiments with Lime-water *and seve ral* Fruits, Herbs *and* Roots.

That such a Diet may be ordered f calculous Patients as will least destroy t Virtue of Lime-water, after the Experimen upon animal Food, we shall relate the E fects of different vegetable Substances upon

36. I infused a Fragment of *B*, eig Grains, in half an Ounce of Juice of *Straw berries*, and two Ounces and a half of C ster-lime-water, after four Days warm D gestion, and seven Days cold, it had lo none of its Weight, nor was there any A pearance of Dissolution about it.

37. I digested a Piece of *B*, 6 *gr.* in ha an Ounce of Juice of *Cherries*, and thr

Ounc

Ounces of Oiſter Lime-water, ſix Days warm; but its Surface was neither ſoftned, nor its Weight diminiſhed.

38. A Fragment of *B*, 6 *gr.* being put in a Mixture of one Ounce of a ſtrong Decoction of *Raiſins*, and three Ounces of Oyſter Lime-water, was not any way changed by three Days warm Digeſtion.

From theſe Experiments we may infer, That all Fruits that have any Acidity or Sharpneſs, whether freſh, ſuch as Gooſeberries, Strawberries, Cherries, Apples, Pears, Plumbs, Peaches, *&c.* or dried, ſuch as Raiſins, Prunes, Currants, *&c.* ought to be abſtained from by ſuch as uſe Lime-water, with a View to the Diſſolution of the Stone.

39. I infuſed a Fragment of *B*, five *gr.* in one Ounce of a Decoction of *Aſparagus*, and two Ounces of Oiſter Lime-water, in few Hours its Surface began to turn white, and in thirty ſix Hours warm Digeſtion it had thrown off in white Scales, a full Grain of its Weight; as the groſſer Parts of the Aſparagus fell always to the Bottom of the Glaſs, it was neceſſary to keep the *Calculus* ſuſpended in the middle of the Mixture, by means of a Thread, otherwiſe the Diſſolution does not ſucceed quite ſo well.

Artichokes ſeem to deſtroy the virtue of Lime-water a little more than *Aſparagus*.

40. A

40. A piece of *B*, nine *gr.* by digeſting warm, four Days in one Ounce of a Decoction of *Turnip*, and two Ounces of Oyſter Lime-water, loſt more than a Grain.

41. A Fragment of *B*, three *gr.* being put in a Mixture of a Decoction of *Parſley* and Lime-water, in the above Proportion, in three Days warm Digeſtion was reduced to 1 $\frac{1}{4}$ *gr.* having thrown off the reſt in whitiſh Scales.

42. In an Ounce of Decoction of *Onions*, and two Ounces of Oiſter Lime-water, a Piece of *B*, of 7 *gr.* loſt by thirty ſix Hours warm Digeſtion, one Grain.

43. Juice of *Lettuce* mixed with Lime-water, deſtroys its Virtues rather more than any of the above.

44. A Fragment of *B*, nine *gr.* in *Unc.* i. of a ſtrong Decoction of *Althea Root*, and two Ounces of Oiſter Lime-water, had by two Days and 18 Hours warm Digeſtion, above a Grain of its Subſtance diſſolved, and a good Part of the reſt rotten and friable.

45. I put a Piece of *B*, 14 *gr.* in Oiſter Lime-water, in which ſome *Juniper-Berries* had been infuſed, which, in two Days and a half, had above two Grains diſſolved.

Green and *Bohea Tea* infuſed in the ſame manner do not conſiderably deſtroy the Virtue of Lime-water.

I might have tried the Effect of a great many more vegetable Subſtances upon Lime-water, had I not been afraid of ſwelling this Paper to too great a Bulk; but from theſe few Experiments it is probable that moſt of the following things may be ſafely uſed by ſuch as drink Lime-water, *viz.* Artichokes, Aſparagus, Spinnach, Lettuce, Succory, Parſley, Purſlane, Onions, Leeks, Cellary, Turnip, Carrot, Potatoes, Radiſhes, Green Peas (*a*).

SECT. VIII.

Experiments with Lime-water *and ſeveral* Medicines.

46. HAVING diſſolved *Tartar ſolubilis drach.* i. in Lime-water *Unc.* i. *ſem.* I put in it a Piece of *B.* four *gr.* which though kept in warm Digeſtion five Days and a half, had not loſt any thing of its Weight, but was become ſomewhat more friable.

47. I digeſted a Piece of the ſame *Calculus* of 4 *gr.* in a Solution of *Nitre* in Oiſter Lime-water, in the above Proportion, which

(*a*) The Juices and Decoctions of *Onions*, *Leeks* and *Cellary* are obſerved to have a conſiderable Power of diſolving the ſofter kind of Gravel Stones; and therefore ought to be preferred to moſt other Vegetables for the Diet of calculous Perſons.

which, in five Days and twelve Hours, had near one Grain of its Subſtance diſſolved.

48. Having immerſed a Fragment of *B.* 7 *gr.* in Oiſter Lime-water *Unc.* iii. *Sal Cathart. amar. drach.* i. after near four Days warm Digeſtion, the *Calculus* had ſcarce loſt any of its Weight, but its external Surface was ſofter, and ſomewhat rotten.

49. At the ſame Time I put a Piece of *B.* ſix *gr.* in Oiſter Lime-water *Unc.* ii. in which was diſſolved *Sal Glauber ſcrup.* ii. after being kept near four Days in a moderate Heat, its Surface was rather more rotten than the *Calculus* in the laſt Experiment, but it had loſt none of its Weight.

50. A Piece of *B*, ſix *gr.* by digeſting warm in Oiſter Lime-water *Unc.* iii. *Sea Salt. drach.* i. betwixt three and four Days had a Grain of its Weight diſſolved.

The Lime-water does not diſſolve moſt of the above Salts, but ſo as the greateſt Part, after ſtanding a little, falls to the Bottom; upon which account I kept the *Calculus* in theſe Experiments ſuſpended in the middle of the Phial by a Thread.

Hence we ſee that Salts, even thoſe of the neutral kind, deſtroy conſiderably the Virtue of Lime-water; and if the diſſolving Power of Lime conſiſts in its extracting the muriatick Salts out of the *Calculus*, (*See be-*

below No. 60.) it is eaſy to ſee how Lime-water, when ſaturated with any of the above Salts, ſhould become leſs effectual for this Purpoſe.

51. I put a Piece of *B*, four *gr.* in a Solution of ſeven Grains of *Aloes*, in Oiſter Lime-water *Vnc.* ii. which by 36 Hours warm Digeſtion, was reduced to about three Grains.

52. I infuſed *Pulv. Rhæi gr.* x. in Oiſter Lime-water, *Vnc.* iii. for twelve Hours, after which I immerſed in it a Piece of *B*, ſix *gr.* in 32 Hours warm Digeſtion, near two Grains of it were rotten and diſſolved.

53. Having infuſed in the ſame manner *Pulv. Jalap. gr.* x. in Oiſter Lime-water *Vnc.* iii. I put in it a Fragment of *B*, ſix *gr.* which by digeſting warm 32 Hours, was reduced to five Grains.

The Lime-water ſeems to draw a ſtronger Tincture from the *Jalap* than the *Rhubarb*, and, upon being mixed with it, acquires a red Colour, as if *Cocheneal* were added to it.

54. A Piece of *B*, four and a half *gr.* being for 34 Hours digeſted warm, in an Infuſion of *Senna drach. ſem.* in Oiſter Lime-water *Vnc.* iii. loſt one Grain.

55. Having diſſolved *Manna ſcrup.* ii. in Oiſter Lime-water *Vnc.* ii. I immerſed in it a Piece of *B*, four and a half *gr.* which,

by

by being kept 34 Hours in a moderate Heat, had above a Grain of its Subſtance rotten and diſſolved.

From theſe Experiments we ſee, that if by drinking Lime-water, the Body ſhould be rendred coſtive, which (eſpecially if no Soap is taken along with it) may ſometimes be the Caſe, it will be better to uſe ſome of the laſt mentioned Purgatives, than any of the Salts in the Beginning of this Section.

SECT. IX.

Experiments ſhewing the Change made on Lime-water *by boiling, and being expoſed to the open Air*, &c.

HAVING in the above Sections made a Variety of Experiments with Lime-water upon different Subſtances, it ſeemed next very proper to try what Alteration would happen to it from boiling or expoſing it to the open Air, and to enquire wherein its Virtue conſiſts.

56. Twelve Ounces of Lime-water being boiled pretty quickly into four, had loſt ſome of its Virtue; for whereas before boiling, a blackiſh Colour was produced by two Parts of it to one of Claret, now it required near two and a Half.

57. If

57. If a Bottle be filled with Lime-water, and cloſely ſtopt, it will keep, ſo far as I have been able to obſerve, for any time, without ſuffering the leaſt Change, or loſing any of its Virtues; but having expoſed four Ounces of it in an open Veſſel, it began very ſoon to throw up a Scum, and let fall ſome Sediment of the ſame Nature; in three Days it had loſt moſt of its fiery Taſte, and ceaſed to turn Claret blackiſh, and in five Days, when the Taſte of the Lime was almoſt quite gone, it neither changed the Colour of Syrup of Violets, nor had any Effect in diſſolving the Stone; and this happens equally ſoon, when placed in the cold Air, as in a moderate Heat, but depends a great deal upon the Narrowneſs or Wideneſs of the Veſſel; for it will be found that the Time in which Lime-water thus expoſed loſes its Virtue, will be more or leſs, according to the Proportion which the Surface bears to the Quantity of the Fluid.

Since Lime-water when thus expoſed, continues to change the Colour of Syrup of Violets, near two Days after it has ceaſed to have any Effect upon Claret, this laſt ſeems to be the ſevereſt Teſt of its Goodneſs.

The Scum that is left behind, after the Lime-water is become effete or evaporated, being

being well beat and mixed with Syrup of Violets, and then ſome common Water added to it, the Mixture after a little ſtanding acquires a green Colour. Hence it ſeems probable, that a great Part of the Virtue of Lime-water conſiſts in this Scum, the Parts of which are ſo minutely divided, and intimately mixed with the Water in its Ebullition with the Quick-lime, as to be abſolutely inviſible, and to remain inſeparable from it, as long as it is kept in a cloſs Veſſel; why they ſhould immediately begin to ſeparate from the Water, and unite together when expoſed to the open Air, may perhaps not be eaſy to account for; poſſibly ſome very active fiery Parts may thus be allowed to fly off from the Lime-water, which before hindered the Union of thoſe earthy Particles of which this Scum is compoſed.

58. Lime-water when mixed with *Vinegar*, in the Proportion of ten to one, does not throw up any Scum; but when it has all evaporated in a moderate Heat, leaves a dark-coloured Sediment, which ſeems however partly to ariſe from the Vinegar.

59. It has generally been thought that no Salt could be got from Lime-water, nor could I by evaporating it ever procure any, the Scum left behind having rather the Appearance

pearance of a fine Lime; yet upon adding one Part White-wine Vinegar, to ten or twelve Parts Stone Lime-water, after ſome Days I perceived ſome cryſtalline Concretions adhering to the Sides of the Glaſs; and having infuſed a Fragment of *B* in ſome Oiſter Lime-water, made with Shells that had laid fifteen Hours after being taken from the Fire, I was ſurpriſed to obſerve in three or four Days a prodigious Number of ſmall-pointed Cryſtalliſations, like fine Needles, about the ſixth Part of an Inch long, darted as it were into its Surface, and giving it ſomewhat the Appearance of a Hedge-hog: But I am apt to think theſe laſt were not owing to the Lime-water, for I could never produce any ſuch Appearance afterwards; and as I had juſt before been making Experiments with Glauber and other Salts, I ſuſpect the Phial uſed in this Experiment had not been quite well clean'd (*a*). We are told indeed that Mr. *Lewenhoeck* diſcovered, by his Microſcopes, in Lime-water a great Number of Saline rigid Particles (*b*); but

(*a*) Having lately obſerved ſomething of the ſame Appearance from Lime-water made with Oiſter Shells, newly taken out of the Sea, and neither boiled nor well waſhed before calcining, I am more incined to believe theſe Cryſtalliſations were owing to the Sea Salt that remains in the Shells, even after Calcination.

(*b*) Muſgrave de Arthritide, chap. ix. § iv.

whether his Imagination assisted him herein, or if it was rather his wanting to find a Similitude betwixt this Water and that got off burnt *calculi*, and the tophaceous Matter, which sometimes issues from the Joints of gouty Persons, or if there are really such Saline Particles, I will not take upon me to determine.

60. As Lime-water does not effervesce with Vinegar or any Acids, and as almost the only thing wherein it betrays any alkaline Quality, is its turning Syrup of Violets green, it seems to partake but little of that Nature; nor do the Virtues of Quicklime itself consist in an Alcali, but are more probably owing to a fixed concentrated Fire, with which the Stone is plentifully stored during the Time of its burning; for Quicklime effervesces much less with Vinegar than with Small-beer, and is very difficultly slacked by either, while Water which is neither acid nor alkali being poured upon it, produces great Ebullition and Heat, and quickly dissolves it.

All acid and acescent Liquors, such as Vinegar, Wine, *&c.* seem not only to destroy the Virtues of Lime-water, by depriving it of the small Degree of Alkali it possesses, but as Dr. *Hales* has found several Bodies remarkable for absorbing or destroying

ing elaſtick Air (*a*), ſo it is not unreaſonable to ſuppoſe that there may be others which have the ſame Effect upon Fire, and that acid and aceſcent Liquors which are potentially cold, ſhould have it moſt remarkably.

The drinking of Lime-water does not render the Urine alkaline, for it neither effervesced with Vinegar, nor turned Syrup of Violets ſenſibly green, altho' the Taſte of the Lime was perceivable in it, as I was informed by Mr. *Miller*, who made the Trial at my Deſire; Nor does Quick-lime itſelf change any of the Humours of our Body into an alkaline Nature; upon adding it indeed to Urine, an intolerable fiery Vapour ariſes, but which is not alkaline, for being mixed with Acids, no Effervescence enſues, though its fiery Nature and Volatility are greatly diminiſhed by them; nor has any Art yet been able to procure from this Spirit the ſmalleſt Quantity of Alkaline, or indeed any other Salt (*b*).

From this it is evident, that the ſtrong alkaline Urine, voided by ſuch Perſons as have taken Mrs. *Stephens*'s Medicines, is not at all owing to the Lime in them, but probably ariſes from the alkaline Salts of

(*a*) Hales Staticks, vol. 1. Analyſis of the Air.
(*b*) Boerhaave Chemia vol. 2. Proceſs 97.

the Potaſh, which make up ſo conſiderable a Part of the Soap; and the diſſolving Virtue of ſuch Urine does not ſeem to conſiſt (as Drs. *Kirkpatrick* and *Hartley* think (*a*) in its alkaline Nature, ſince we find in Mr. *Miller*'s Urine this Power without that Quality; and ſince Dr *Hales* has ſhown that the Potaſh, which is almoſt the only alkaline thing in theſe Medicines, has no Effect in diſſolving the Stone (*a*).

Quer. May not the diſſolving Virtue of Lime conſiſt in the Power that it ſeems to poſſeſs of extracting the muriatick Salts out of the Humours of our Body? Thus we ſee, that how much ſo ever the Urine abounds with them, yet after adding Quick-lime to it, no Art has been able to make it afford a ſolid Salt; and may not the Bond of Union of the earthy and other Particles that compoſe the *Calculus*, be greatly weaken'd, by being deprived of the Salts that are ſo intimately united with them?

61. From the great Affinity that has been generally ſuppoſed by medical Writers to be betwixt the Gout and Gravel, it might perhaps be worth while to try the Effects of Lime-water in this Diſeaſe alſo; and the learned

(*a*) Kirkpatrick's Caſe, and Hartley's View of the preſent Evidence, &c. (*b*) See below N°. 62.

learned Dr. *Cheyne* having aſſerted that the gouty Chalk Stones and Gravel Stones were, as to all their eſſential Qualities, the ſame, and yielding both the ſame Principles when chymically treated (*a*) I procured ſome of them, and infuſed them in Lime-water. At firſt, being ſpecifically lighter than the Water, they ſwim'd; but, after emitting a great Quantity of Air-bubbles, they ſoon fell to the Bottom, and, in a Day or two, were become as ſoft as Butter; but having afterwards infuſed a Piece of this gouty Matter in common Water, I found preciſely the ſame Effects from it as from the Lime-water: So that whatever Probability there may be of Lime-water doing Service to gouty People, from the ſuppoſed Affinity betwixt it and the Gravel, yet nothing can be drawn from this Experiment.

SECT. X.

Experiments with Lime-water *and* Soap, *&c.*

It appearing from Dr. *Hales*'s Experiments that Soap is poſſeſſed of a conſiderable Power of diſſolving the Stone, and that

(*a*) Cheyne on the Gout, p. 72. Edit. 4.

this is chiefly owing to the Lime that enters into its Compoſition, I was excited to make ſome Experiments upon it, with a View ſtill further to diſcover wherein its Virtue lay, and what Proportion it bears to that of Lime-water, whether Lime-water might not be improved by it, and how far their lithontriptick Quality is deſtroyed by the ſame things.

62. Having diſſolved *Potaſh*, *drach.* ii. *ſem.* in boiling Water *Unc.* iv. I put in it a Piece of *A* weighing 9 Grains, which, in 15 Days warm Digeſtion, loſt very little of its Weight, nor was its Surface ſoftned to any Depth, however its Subſtance ſeemed to have been rendred more friable; for upon pouring boiling Water upon it, it rent in ſeveral Places.

63. I boiled Stone-lime-water, *Unc.* xiv. with Potaſh *drach.* v. in to *Unc.* vi. and having laid a Piece of *A* of 11 ½ *gr.* in it, found that after ſtanding 12 Days in a gentle Heat, it had loſt 7 ½ Grains of its Weight.

64. A Pound and a half of boiling Water, in which an Ounce of Potaſh was diſſolved, being poured on 2 ½ Ounces of Quick-lime, after the Ebullition was over, and the Lime was faln to the Bottom, afforded a very fiery corroſive Liquor, which, if applied to the Tongue, in the ſmalleſt Quantity, was in

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Hazard of bringing off the Skin; a Piece of *A*, 10 ½ *gr.* was diſſolved in it in 15 or 16 Hours in a moderate Heat. A *Lixivium* of the ſame kind, which I made afterwards, but which did not ſeem ſo ſtrong, diſſolved a Piece of *B*, three *gr.* in twelve Hours, while a Fragment of the ſame *Calculus* of 14 *gr.* required three Days and ſix Hours of a cold Maceration in *Aqua fortis ſimplex* (*a*) to diſſolve it.

The great diſſolving Power of this *Lixivium* ſeems to ariſe from its abounding ſo much with the fiery Particles of the Quick-lime, which are ſtrongly attracted by the alkaline Salts of the *Potaſh* (*b*); for, as Sir *Iſaac Newton* has obſerved, that the Particles of Light are moſt ſtrongly attracted by ſulphureous Bodies, ſo there ſeems to be a mutual Sympathy or Agreement betwixt alkaline Salts and the Particles of Fire.

Inſtead of an Ounce I diſſolved *drach.* ii. of Potaſh in *lib.* i. *ſem.* of Water, and poured it on Quick-lime as above, thinking that the *Lixivium* thus procured, would be poſſeſſed of a greater Power of diſſolving the Stone than ſimple Lime-

(*a*) Pharmacop. Edinburgenſ. p. 175.

(*b*) As a Proof of which, I have obſerved that the Strength of it depends in a great meaſure upon the Quick-lime's being well burnt, and quite freſh from the Fire.

water, and at the ſame time not ſo fiery as to be in danger of deſtroying any Parts of the human Body; but I ſoon found that any Advantage I expected from its greater lithontriptick Virtue, was more than balanced by the extreme Nauſeouſneſs communicated to it by the alkaline Salt.

65. A Piece of *A* of 17 ½ *gr.* being put in a Solution of *Alicant* Soap in warm Water, after digeſting warm ſix Days, had a pretty thick white Cruſt all round it ready to fall off, which when removed, the undiſſolved Part weigh'd 14 *gr.* In 19 Days it was reduced to ſix Grains.

66. It is not ſo eaſy as one would at firſt think, to account for the diſſolving Virtue of *Alicant* Soap; for of its three Ingredients, Lime-water, alkaline Salt, and Oil (*a*), only the firſt has any conſiderable Power this Way, the ſecond having very little, and the third none at all. The firſt and ſecond mixed together, have not more than the firſt alone (*b*); and the ſecond and third united, have none at all; and yet of theſe two laſt, the Soap chiefly conſiſts; beſides, as Lime-water when boiled into a Lie with Potaſh, rather loſes than acquires any diſſolving Virtue, it is difficult to give a Reaſon why, after

(*a*) See the Note at the Beginning of this Paper.
(*b*) Compare N°. 10, 11 and 12. with N°. 63. above.

ter the Addition of ſo much Oil in making Soap, this Virtue ſhould not be ſtill much more weakened: To account for this it ought to be obſerved, that as in boiling Lime-water a Scum is always left behind, ſo the vaſt Quantity of Lime-water that is added to the alkaline Salt and Oil in the making of Soap muſt, when evaporated, leave a great deal of the Scum mixed with the other two Ingredients; and as we have found that the Virtue of Lime-water conſiſts chiefly in this Scum (*a*), ſo although the watery Humidity in Soap bears but a ſmall Proportion to the other Ingredients (*b*), yet there may be united with them what contains the Virtues of a very great Quantity of Lime-water. But further, it is probable that the Lubricity given to the Soap by means of the Oil, may enable the active Parts of the Lime-water and Pot-aſh to enter the Pores, and penetrate more eaſily into the Subſtance of the *Calculus*, and thus facilitate its Diſſolution. That I might be more fully ſatisfied of this, I made a Solution of *Alicant* Soap in Stone-lime-water, to ſee if the Virtue of the Lime-water would be increaſed by its Mixture with

(*a*) See No. 57 above.

(*b*) Mr. *Geofroy* ſays, that in 180 *lib.* of Soap there are only 15 *lib.* of a watery Humidity. See *Hales*'s Experim. p. 13.

with the Soap, nor was I diſappointed, for I found this to have a greater diſſolving Power than either a Solution of Soap in common Water, or Lime-water by itſelf, or even than the aggregate of the diſſolving Powers of Soap and Lime-water when unmixed; for a Piece of *A*, 18 Grains, after lying five Days in it in a moderate Heat, was reduced to ſix Grains, ſeveral white Cruſts having fallen off in this Time; after ſtanding 24 Hours more, finding it had loſt none of its Weight, nor any ſenſible Impreſſion made on its Surface, and obſerving that the Bottle was not very cloſely cork'd, I ſuſpected that the Solution had loſt its Virtue, which evidently appeared by its having loſt all Taſte of the Lime-water; I therefore put the *Calculus* in a new Solution, where in three Days it was all diſſolved, except a ſmall *Nucleus* weighing a Grain.

[66.] Another Time when I made the ſame Experiment, I did not find the Virtue of the Lime-water ſo much increaſed by the Soap; for a Piece of *B*, 10 Grains, in ſuch a Solution, in two Days and nine Hours, only loſt a little more than three Grains, while a Piece of the ſame Weight in Stone-lime-water alone loſt in that Time two Grains. Whether the Soap in the one Caſe was better than in the other, or if the due Proportion

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in mixing them was not hit in this laſt Experiment, I cannot poſitively affirm.

It may be proper to obſerve, that the Lime-water muſt be pretty hot, and the Soap and it muſt be agitated together for a conſiderable Time, otherwiſe they will not unite.

The quick Diſſolution of the Stone in the two laſt Experiments affords a clear Reaſon for the Succeſs which attended the Stone-lime-water in Mr. *Miller*'s Caſe, which we ought to conſider as deriving its Efficacy in a good meaſure from being taken along with a conſiderable Quantity of Soap.

67. Having found the diſſolving Virtue of Oiſter-ſhell Lime-water, much greater than that of Stone-lime, I thought a Solution of Soap in it would have a proportionably greater Effect; but here I was ſoon diſappointed, for I found it impoſſible by any Art to make them unite, which ſeems to be owing to the Sea-ſalt that abounds in the Oiſter-ſhells, and which the Fire had not been able intirely to deſtroy; however, as the Cockle-ſhell Lime-water (No. 17.) diſſolved Soap, I ſuſpected that if Oiſter-ſhells were long expoſed to the Weather before calcining, the Water got off them might probably do ſo likewiſe; accordingly having procured ſome that had laid long upon the Sea-ſhore, and burnt them, I found the Lime-

water

water they afforded mix with Soap as well as any other (*a*); but neither it nor the Cockle-ſhell Lime-water ſeem to have their Virtue ſenſibly increaſed by the Soap.

May not the Particles of animal Lime be conceived more ſubtile, ſaponaceous and penetrating, than thoſe of Stone-lime? and does not Shell-lime-water owe its greater diſſolving Power to this? and being already ſomewhat ſaponaceous and penetrating, the Effect of Soap upon it will not be ſo remarkable as upon Stone-lime-water, which is more deſtitute of theſe Qualities.

Stone-lime-water is undoubtedly as ſtrong of the Lime as the other, and the Effects of Stone-lime in ſeveral Caſes (*b*) ſhew it to be rather ſtronger than that of Shells; ſo that the different diſſolving Powers of theſe two Waters muſt be owing to ſomething elſe than their different Strengths to ſome peculiar Quality in the Shell-lime.

[67.] Having poured a very weak Solution of

(*a*) I boiled ſome Oiſter-ſhells four or five Hours, changing the Water thrice in that Time, thinking that this might free them of their Salt, and render their Lime-water miſcible with Soap, but without any Effect; however, I ſhould adviſe the boiling and waſhing of theſe Shells before they are calcined, as it ſeems to free the Lime-water of ſomewhat of a fiſhy Taſte it otherwiſe has.

(*b*) It raiſes much greater Heat and Ebullition with cold Water than Shell-lime.

of Soap upon some calcined Oister-shells, I procured a Liquor tasting somewhat of Soap, and strongly of Lime, which in 38 Hours warm Digestion reduced a Piece of *B*, four Grains, to 1 $\frac{1}{3}$ Gr.

After this I dissolved three Drachms of Soap in 35 Ounces of boiling Water, and poured it on five Ounces of calcined Oister-shells; the *lixivium* which they afforded tasted strong of the Soap as well as Lime, and was pretty pungent and disagreeable; being mixed with Urine, it produced the same Appearance as simple Lime-water (*b*), but raised a Smell something like that of burnt Horn. A Piece of *B*, 3 $\frac{1}{2}$ Gr. being immersed in it, was in 24 Hours warm Digestion reduced to one Grain.

The Strength of this *lixivium* is probably owing to its abounding with the fiery Particles of the Quick-lime, which are more strongly attracted by the Solution of Soap (by means of the alkaline Salt in it) than by common Water.

68. A Solution of Soap in fresh Small-beer had no Effect in dissolving some Pieces of *A*, although allowed to ly eight Days in it in a moderate Heat.

69. A Solution of Soap made in one Part *Scots aquavitæ* and two Parts Water, has very

(*a*) See No. 8 above.

very little Virtue, though more than the preceeding.

Thus we ſee that the diſſolving Power of Soap, as well as Lime-water (*a*), is deſtroyed by fermented Liquors, and greatly weaken'd by Spirits, and conſequently how proper it is for ſuch as uſe it to abſtain from them.

70. I put a Piece of *B*, ſeven Grains, in a Solution of *Alicant* Soap, which by being kept in a gentle Heat for four Days loſt two Grains of its Weight.

71. At the ſame time I infuſed two Pieces of *B*, each weighing eight Grains, the one in two Ounces of the above Solution with a Drachm of white Sugar, and the other in two Ounces of the ſame with a Drachm of Honey; the *Calculus* in the Solution with Sugar loſt about two Grains in four Days warm Digeſtion, while the other was ſcarcely diminiſhed in Weight above one Grain.

As in refining Sugar a good deal of Lime-water is employed, ſo it is probable that ſome of the more active and ſubtile Parts of the Lime may adhere to it; and this may be the Reaſon why it deſtroys the Virtue of Lime-water leſs than almoſt any other Subſtance, and ſeems ſcarce to weaken the diſſolving Power of Soap at all.

From

(*a*) See No. 24, 25, 26 and 30, above.

From this Experiment it appears how much the lithontriptick Virtue of Mrs *Stephens*'s Medicines muſt be weakened by her ordering the Decoction to be ſweeten'd, and the Pills to be made up with Honey, and that in place of it the *Syrupus de Saccharo* and Sugar may be ſubſtituted with conſiderable Advantage.

72. I infuſed a Fragment of *B*, 5 ½ Gr. in a Solution of *Alicant* Soap, in a ſtrong Decoction of *Aſparagus*, which, after digeſting warm for five Days, had loſt near two Grains.

73. Moſt People have doubtleſs had Occaſion to obſerve, that while the internal Part of *Alicant* Soap is of a blue Colour marbled with white, its Surface, which is expoſed to the Air, is reddiſh, and ſometimes yellow or white: Now as by the above Experiments we have found, that the lithontriptick Virtues of Soap and Lime-water are in many Inſtances deſtroyed by the very ſame things, and as Lime-water, by being expoſed to the Air, is ſoon rendred effete, I made the following Experiment, to ſee if that Part of the Soap which has its Colour changed by the Air, poſſeſſes leſs Virtue than the reſt.

Having diſſolved ſome of the internal bluiſh Part of *Alicant* Soap in warm Water,

ter, I infuſed in it a Piece of *B*, ſix Grains, which in three Days warm Digeſtion loſt near two Grains.

At the ſame time I made a Solution of equal Strength, of the external Part of the ſame Soap in warm Water, and immerſed in it a Fragment of *B*, ſix Grains; after digeſting 58 Hours warm, and 15 cold, it had only loſt about $\frac{3}{4}$ of a Grain.

α. From this Experiment it is plain, that ſuch as ſwallow Soap for the Stone or Gravel, ſhould carefully throw aſide that Part of it which has had its Colour changed by the Air; and as in very old Soap I have ſeen this about $\frac{1}{3}$ of an Inch thick, it is very probable that two Ounces taken with this Caution will have as much Effect as 2 $\frac{1}{2}$, when good and bad is ſwallowed all indifferently together.

β. Hence it alſo follows how improper it is to make Soap into Pills, unleſs they are preſently to be uſed, and conſequently how much Mrs. *Stephens*'s Medicines muſt have ſuffered in this Way; for as the Air in rendring the Soap effete, acts only upon its external Surface, the more the Surface is increaſed, the greater will the Quantity be that is deprived of its Virtue. Thus ſuppoſe a cubical Piece of Soap of four Inches, made into 1200 or 1500 Pills, its Surface,

which

which was before only 96, will now perhaps be above 1000 ſquare Inches, and conſequently in a given Time the Pills muſt loſe ten times more of their Virtue, than ſuch a Piece of Soap, if allowed to remain whole. Soap ſeems alſo to be rendred a good deal the worſe when reduced to a Powder, whereby not only its lithontriptick Power is weakened, by its Surface being thus increaſed and expoſed to the Air, but the watery and oily Parts of the Soap being moſtly evaporated, leave the alkaline Salt very much exalted, and deprived in a great meaſure of that which was intended to correct it.

γ. From this it ſtill further appears, that the diſſolving Virtue of Soap lies chiefly, if not wholly, in the Lime that is in it (*a*), and not at all in its alkaline Nature, which is not deſtroyed by being expoſed to the Air.

74. Potaſh *dr.* iii. Oil of Olives *dr.* v. Stone-lime-water *unc.* iv. being mixed and boiled over the Fire to the Conſumption of one half, I put a Piece of *A* in it; but, after ſtanding in a gentle Heat ſeveral Days, found no Appearance of its being in a diſſolving State.

As in this Mixture the Oil was not ſuffi-

(*a*) See No. 60 and 66 above.

ciently united with the Potaſh and Lime-water, I imagine the Surface of the Stone being beſmeared by it, hindred theſe from having that Effect they otherwiſe would have had. *See* No. 62 *above*.

From the ſame Cauſe I fancy it was that Soap-lees and Oil did not diſſolve the *Calculus* in one of Dr. *Hales*'s Experiments (*a*); he ſeems indeed to think, that, in order to the Soap-lees exerting their Virtue, the Oil muſt be ſeparated from them, which he reckons is done in the Courſe of the Circulation; but, with Submiſſion, I would think it only neceſſary that the Oil ſhould loſe its Nature ſo far as to become miſcible with Water: Thus we find a Solution of Soap diſſolves the Stone, although the Oil be not ſeparated from the other Ingredients of the Soap.

SECT. XI.

Propoſal of the Method of Cure.

HAVING given an Inſtance of the Succeſs of Lime-water in diſſolving the Stone, and illuſtrated its Virtue this Way by a Variety of Experiments, in the Courſe of which we

(*a*) Page 31.

we have been ſo lucky as to diſcover the remarkable Virtue of Oiſter and Cockle-ſhell-lime above any other, it remains that a Method of Cure be laid down, founded upon the above Hiſtory and Experiments: Firſt then I would adviſe the Patient to ſwallow, in any Form that is leaſt diſagreeable, an Ounce of *Alicant* Soap every Day, and drink three *Engliſh* Pints or more of Oiſter or Cockle-ſhell Lime-water; if he takes the Soap in Pills, or ſhaved down as Mr. *Miller* did, he may divide it into three Doſes, the largeſt to be taken faſting in the Morning early, the ſecond at eleven before Noon, and the third at five after Noon, drinking above each Doſe a large Draught of the Lime-water, the Remainder of which he may take after Dinner or Supper inſtead of other Liquor: The diſagreeable Taſte of the Lime-water may be blunted by adding a very little Sweet-milk to it, and is quite deſtroyed by waſhing one's Mouth immediately after drinking it with a little Vinegar and Water, which however muſt be carefully ſpit out again (*a*). But if the Patient finds Difficulty in taking the Soap in this Form, or if it does not ſit eaſy on his Stomach, let him diſſolve (*b*) an

(*a*) *Dr.* i. *ſem.* or *dr.* ii. of Juniper-berries infuſed in every Chopin-bottle of it will mend its Taſte much.

(*b*) A Solution is preferable to a Decoction. *See* No. 56 *above.*

Ounce of it in an *Engliſh* Pint and a half of warm Lime-water, made with Shells that have been long expoſed to the Weather, and take this at three different times, drinking the reſt of the Lime-water by itſelf. If it ſhould happen that Shell-lime-water cannot be had, then let him take the ſame Quantity of Stone-lime-water, with at leaſt an Ounce and a half of Soap, ſince its diſſolving Power is ſo much increaſed by it (*a*).

It may be obſerved, that a Solution of Soap in Lime-water has not ſo diſagreeable a Taſte as a Solution or Decoction of it in common Water.

The Soap is not only proper to be taken along with the Shell-lime-water, as it is endued with a conſiderable Power of diſſolving the Stone, but likewiſe as it will contribute greatly to keep the Belly eaſy, and prevent any Coſtiveneſs that might otherwiſe be occaſioned by the Lime-water: But if we ſhould meet with any Patients who have an invincible Averſion to Soap in any Shape, the above Experiments give us Reaſon to think that Oiſter or Cockle-ſhell Lime-water alone drunk in large Quantities, will have fully greater Effect in diſſolving the *Calculus*, than Stone-lime-water even when aſſiſt-

(*a*) No. 66 above.

aſſiſted by Soap (*a*); ſo that in place of all Mrs. *Stephens*'s Medicines, which to many delicate People can be of little Uſe, we may ſubſtitute this Lime-water with equal, nay probably greater Succeſs.

At firſt the Patient ſhould begin with a ſmaller Quantity of the Lime-water than what is mentioned above, which he may increaſe by degrees, and ought to perſevere in the Uſe of, eſpecially if he finds any Abatement of his Complaints, or Symptoms of the Stone diſſolving, for ſeveral Months, nay, if the Stone be very large, Years, during which Time he ſhould abſtain from all acid and fermented Liquors, as Vinegar, Wine, Ale, Beer, Cyder, *&c.* For his Drink he may have Water and Milk, or a Ptiſan made with Roots of Althea, Parſley and Liquorice; but if he has been accuſtomed to more generous Liquors, and cannot confine himſelf thus far, he may be allowed a little weak Punch made without Sowring; only as the Virtue of Soap is much weakened when diſſolved in Punch (*b*), and intirely deſtroyed by Spirits (*c*), and as Quick-

(*a*) Compare the Experiments of the diſſolving Power of Oiſter and Cockle-ſhell Lime-water, No. 14,---20, with Experiments of the Effect of a Solution of Soap in Stone-lime-water, No. 66 See alſo the Table at the End of this Eſſay.

(*b*) See No. 69 above.

(*c*) *Hales*'s Experiments, p. 2.

lime has its Nature conſiderably changed by them (*a*), they ought not to be drunk by themſelves, nor even in Punch to any Quantity. It will alſo be proper to be ſparing in the Uſe of ſalt Meats (*b*), and Honey (*c*), and to refrain from all Fruits that have any Acidity or Sharpneſs (*d*), while, on the other hand, Milk and Sugar (*e*), and animal Food with the Vegetables mentioned, No. 39,----45. may be ſafely uſed.

As the Cure depends upon the Urine being ſtrongly impregnated with the Virtues of the Lime-water, the Patient ought to drink no more of any other Liquors than is neceſſary to quench his Thirſt, and ſhould retain his Urine as long as he can without Uneaſineſs, that it may have the greater Time to act upon the Surface of the Stone.

If the Lime-water ſhould chance to occaſion Coſtiveneſs, it will be proper now and then to take an aloetick Pill, or any other of the Purgatives mentioned, No. 51, ----55.

2*dly*, In order to render the Cure ſtill more ſpeedy, I ſhall offer a Propoſal which, how

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(*a*) See No. 1 and 2 above.
(*b*) No. 50.
(*c*) No. 34 and 71.
(*d*) No. 36 and 38.
(*e*) No. 33 and 35.

how far it may ſucceed, is left to the Judgment and Experience of others.

It is this, That ſuch Perſons as have a Stone in the Bladder, ſhould, at the ſame time they are taking the Medicines above directed, have four or five, or more Ounces of tepid Shell-lime-water injected into their Bladder every Day, to be retained as long as they can without Pain, for which Purpoſe they ſhould evacuate their Urine immediately before the Injection: Were it not for the Trouble of introducing the Catheter, ſuch Injection might be made at leaſt twice a Day; and if a flexible Catheter were always kept in the Bladder (*a*), it might be done as often as one pleaſed, and the Diſſolution of the largeſt Stones might be quickly procured. It will be proper to let the Patient drink Lime-water ſome Weeks before he uſes it by way of Injection, in order to mitigate his Pains, and take off that Tenderneſs of the internal Coat of the Bladder which generally attends this Diſeaſe, after which he will with leſs Difficulty be able to retain it when injected, ſo as it may have Time to act on the Surface of the Stone.

The Injection of warm Water into the Bladder has often been practiſed in order to

(*a*) Heiſter. chirurg. p. 883 and 938.

the high Operation for the Stone; and if then it was ſometimes attended with bad Conſequence, this ſeems to have been owing to the great Quantity injected, whereby the muſcular Fibres of the Bladder, which reſiſt ſuch Diſtenſion, were too much and too ſuddenly ſtretched; but in the preſent Caſe (unleſs the Stone be very large) ſo ſmall a Quantity will be ſufficient, that if it be cautiouſly gone about, I do not ſee any Hurt it can do: And as from the Quantity to be injected, no bad Conſequences are to be feared (*a*), ſo neither is it probable that, from the Quality of the Liquor, any would ariſe; for Lime-water, we ſee, may be taken into the Stomach in great Quantities without any Harm, and when applied to the Eye, one of the tendereſt Parts of the human Body, it occaſions no conſiderable Uneaſi-

(*a*) In *Le Dran*'s Obſervat. 80. we find a Decoction of Marſhmallows was injected into the Bladder, Morning and Evening, for a conſiderable Time, without the ſmalleſt Inconveniency, and with remarkable good Succeſs in that particular Caſe, which was, as he calls it, a *Veſſie racornie*; to ſave the Trouble of introducing the *Catheter* twice, he let it remain in the Bladder from the Morning till after the Evening Injection was over. And in Dr. *Hales*'s *Staticks*, Vol. 2. p. 212. we are told, that in four Hours Time he cauſed, by means of a double Catheter there deſcribed, 900 cubick Inches, or three *Engliſh* Gallons of warm Water, to flow in and out of a Bitch's Bladder in a continued Stream, without the leaſt Harm or Inconvenience to the Animal that he could perceive.

eaſineſs; it is made Uſe of to waſh Sores with very good Succeſs; and as ſometimes along with the Stone there are ſmall Ulcers or Excoriations in the Bladder, the Lime-water either injected or taken by the Mouth, will diſpoſe them to heal up, inſtead of having any of the bad Effects which are to be feared from Mrs. *Stephens*'s Medicines, which render the Urine ſo alkaline, and of which I had lately occaſion to ſee an Inſtance in a Patient, who having ſeveral Symptoms of a Stone in the Bladder, had frequently taken a good deal of Soap, by which his Pains, eſpecially in making Urine, were always ſo greatly increaſed, that he was obliged to lay aſide the Uſe of it; but upon enquiring more narrowly into his Caſe, I found he had an Ulcer in his Bladder, and paſſed conſiderable Quantities of purulent Matter.

That the Injection of Lime-water into the Bladder may be rendred more ſafe, and attended with leſs Uneaſineſs, a Drachm of *Starch* may be diſſolved in ſix or ſeven Ounces of Oiſter-lime-water, and juſt brought to boil over the Fire, ſtirring it all the while; for having put a Piece of *B*, *7 gr.* in ſuch a Mixture as this, in three Hours time there was a white rotten Cruſt formed all round it, which fell off upon ſhaking the Glaſs,

and

and in 24 Hours Time, above a Grain of it was diſſolved. The Heat uſed in this Experiment did not exceed 100 Deg. in *Farinheit*'s Thermometer.

The fourth Part of the Yolk of an Egg being mixed with ſix Ounces of Lime-water, does not weaken its Virtues any more than the Starch, and may occaſionally be uſed in place of it.

I tried alſo *Gum Arab.* and *Sem. Lini*, but they both deſtroy the Virtue of Lime-water, more than the Starch or Egg.

Such as have no Stone in the Bladder, but are ſubject to frequent Fits of Gravel in the Kidneys, might very probably prevent theſe, by drinking every Morning, two or three Hours before Breakfaſt, an *Engliſh* Pint of Oiſter or Cockle-ſhell Lime-water, which though it might be too ſmall a Quantity to have great Effect in diſſolving the Stone, yet would probably prevent any new Concretions.

SECT. XII.

Comparative Value of the ſeveral Medicines.

THAT the Method of Cure juſt now propoſed may appear with greater Advantage,

I ſhall ſtate in few Words the comparative Value of the ſeveral Medicines that are thought to bid faireſt for diſſolving the Stone; of theſe only Lime-water and Soap can be ſafely taken into the human Body. Spirit of *Nitre*, Soap-lyes, or the fiery *Lixivium* of No. 64. and Quick-lime, being all mortal Poiſons, are only capable of being uſed when diluted in a large Quantity of ſome watery Vehicle, and even then they do not promiſe ſo much as Lime-water; for as the Virtue of Spirit of *Nitre* ſeems to conſiſt in its extraordinary corroſive Acidity, which muſt be deſtroyed before it get into the Blood, and ſtill more ſo before it arrives at the Bladder, I think nothing can reaſonably be expected from it, or any Medicines of this kind. In anſwer to this it has been alledged, That although vegetable Acids are entirely changed by the digeſtive Powers of the human Body; yet this is not the Caſe with reſpect to Mineral Acids, to which Purpoſe the learned *Boerhaave* is quoted, where, in his Chymiſtry, he obſerves, that ſuch Acids as are fit to diſſolve Gold, Silver, *&c.* are generally too ſtrong for the concoctive Powers of Animals, and hence become Poiſons: But this Authority is as ſtrong as any thing can be againſt thoſe who uſe it; for if the mineral Acids a-

bove-

bove-mentioned are entirely changed by the Powers of the human Body, 'tis confeſſed they can have no Effect in diſſolving the Stone; and if they are not deſtroyed, they become Poiſons. and conſequently cannot ſafely be exhibited with a View to the Diſſolution of the *Calculus*.

With regard to the Soap-lees, or the fiery *Lixivium* of No. 64. it may be obſerved, that as they owe a great deal of their deſtructive Quality to an ingredient that has ſcarce any Effect in diſſolving the Stone (*a*), they do not ſeem ſo well calculated for this End as Lime-water, which at the ſame time that it is ſtrongly ſaturated with that to which the Soap-lees owe their Virtue, is free of the alkaline Salt which renders them in a great Meaſure ſo noxious. But to ſet the Virtue which theſe two Medicines have of diſſolving the Stone ſtill in a clearer Light, it may not be improper to compare the Effects, which Soap-lees had on Dr. *Jurin*, with what we have ſeen of Lime-water in the Caſe of Mr. *Miller*.

Dr. *Jurin*'s Stone in his Bladder ſeems to have been but of two or three Months ſtanding, when he began his Medicines; whereas Mr. *Miller*'s was of above fifteen Months;

(*a*) See No. 62. above.

Months: Dr. *Jurin* took Soap-lees in very large Doſes for near five Months before he paſſed any Stones; and, after taking them near ſeven Months, does not ſeem to have been perfectly cured (*a*); Mr. *Miller* in ſeven Weeks after he began to drink Lime-water, voided one Stone, as in three Months he did another, and has ever ſince been perfectly well. Mr. *Miller* had no Pain upon uſing the Lime-water (*b*), but in few Days began to perceive a gradual Abatement of all his Complaints, while Dr. *Jurin* had his Pains conſiderably increaſed by the Soap-lees at firſt, nor does he ſeem to have had any ſenſible Eaſe, till after uſing them above four Months.

As for Quick-lime, its Virtues are more plentifully and ſafely conveyed into the Blood by Means of Lime-water than any Way elſe; if allowed to ſlacken for two Months, as Mrs. *Stephens* has directed, it gains in Mildneſs only what it loſes in Virtue (*c*), though even after all, it is a Medicine

(*a*) See his Caſe, p. 14.

(*b*) Nor is Mr. *Miller* a ſingle Inſtance of this, for I have juſt now two Patients drinking Cockle-ſhell Lime-water for the Stone, who, inſtead of having their Pains increaſed by it, had not uſed it much above a Fortnight, when they found themſelves ſenſibly eaſier. One of them, upon diſcontinuing the Lime-water ſoon grew worſe, but upon having Recourſe to it again, found himſelf better.

(*c*) See No. 20. above.

cine which neither ſeems innocent nor agreeable.

But further, how ſtrongly ſoever the above three Medicines may be endued with a Virtue of diſſolving the Stone, yet the Quantity of watery Fluid neceſſary to be added to them, before they can be made uſe of with any Safety, is ſo large, that the Mixture does not poſſeſs near ſo great a diſſolving Virtue as Lime-water (*a*), which has this inconteſtible Advantage, that it may ſafely be injected into the Bladder, and by being immediately, and before it has ſuffered any Change applied to the Surface of the *Calculus*, may very conſiderably haſten its Diſſolution.

Upon the whole, we have found in Lime-water, (that eſpecially which is got off Oiſter or Cockle-ſhells) a *Menſtruum* for the *Calculus*, ſo innocent and mild, that it may be taken into the Stomach without any Harm, and injected into the Bladder without the leaſt Danger of corroding it; ſuch a *Menſtruum* as this the learned *Boerhaave* did not deſpair of being one Day diſcover-

ed,

(*a*) Soap-lees muſt be diluted with at leaſt ſixteen times their Quantity of a watery Fluid, in order to ſave the Throat and Stomach from their Acrimony. *Sp. of Nitre* and *Aqua-fortis* have not yet, ſo far as I know, been ventured upon in any Shape, and Mrs. *Stephens*'s Powder diluted as ſhe orders it, is no better than ſo much weak Lime-water.

ed, as he had found the Spirit of Rye-bread have a ſurpriſing Power to diſſolve certain Stones, which however did not injure any Parts of the human Body (*a*).

SECTION XIII.

The diſſolving Powers of the Menſtrua.

If, in the foregoing Experiments, the Weights of the ſeveral Pieces of the ſame *Calculi*, and the Times they were immerſed in the different *Menſtruums* had been all equal, the Strengths of the *Menſtruums* would at firſt Sight have appeared; but ſince the Caſe is otherwiſe, and I did not advert to this Inconveniency ariſing from it, till it was too late, in order to make it up as much as poſſible, I ſhall here ſubjoin a Table of the Proportions which the diſſolving Powers of the *Menſtruums* for the *Calculus* in the above Experiments bear to one another, but previous to it, I ſhall briefly mention the Grounds upon which it is built.

I ſuppoſe that the Times in which different Pieces of the ſame homogeneous *Calculus* will diſſolve in any *Menſtruum*, to be as their Surfaces; and ſuppoſing their Surfaces

(*b*) *Boerhaave chemia*, Vol. 1. *de Menſtruis.*

faces to be as the ſquare Roots of their Weights or Quantities of Matter (which would be exactly true were they all either perfect Cubes or Spheres, or their Figures exactly ſimilar) the Times required for two different Pieces of the ſame *Calculus* to diſſolve in any *Menſtruum* will be *cæteris paribus* as the ſquare Roots of their Weights.

If the Weights of two Pieces of the ſame homogeneous *Calculus* be equal, and the Times which they are immerſed in different *Menſtruums* be alſo equal, the Powers of the *Menſtruums* will be as the Quantities diſſolved.

If the Times, Weights and Quantities diſſolved be unequal, the Powers of the *Menſtruums* will be as the Quantities diſſolved directly, and as the Times and ſquare Roots of the Weights inverſely: Thus ſuppoſing *m. M.* to be the *Menſtruums*, *q. Q.* the Quantities *t. T.* the Times, *w. W.* the Weights, $m : M :: q \times T \times \sqrt[2]{W} : Q \times t \times \sqrt[2]{w}$.

If two *Calculi* of different Textures be put in the ſame *Menſtruum*, the hardneſs of the one will be to that of the other, as the Times and ſquare Roots of the Weights directly, and as the Quantities diſſolved inver-

verſely. If $m = M$, then $b : H :: t \times \sqrt[3]{w} \times Q : T \times \sqrt[2]{W} \times q$.

Hence by comparing Experiment 15 and 16, the Hardneſs of the *Calculus A* is to that of *B*, as 380 to 406, and this it was neceſſary to take Notice of, as in ſeveral Articles of the following Table, an Allowance was made for this Difference in the Hardneſs of theſe two Stones.

TABLE.

Menſtruums.	*Diſſolving Powers.*
Stone-lime Water, *Exper.* 11. -	202
Oiſter-ſhell Lime-water, *Exp.* 16.	583
Cockle-ſhell Lime-water, *Exp.* 17.	583
Lime-water made with Oiſter-ſhells that had lain 35 Days after calcining in the open Air, *Exp.* 20. -	215
Oiſter-ſhell Lime-water and Honey *Exp.* 34. - - -	146
Oiſter-ſhell Lime-water and Sugar, *Exp.* 35. - - -	340
Stone-lime-water in cold Digeſtion *Exper.* 13. - - -	091
Oiſter Lime-water in cold Digeſtion, *Exper.* 18. - - - -	229.

Menſtruums.	*Diſſolving Powers.*
A Solution of Soap in common Water, *Exper.* 70. - -	143
A Solution of the external Part of Soap, *Exp.* 73. - -	079
A Solution of Soap in Stone-lime-water, *Exp.* 66. firſt Trial -	406
Second Trial -	494
Exper. [66.] - -	328
A Solution of Soap with Sugar, *Exp.* 71. - - -	134
A Solution of Soap with Honey *Ex.* 71.	67
Lime-water made by pouring a weak Solution of Soap on calcined Oiſter-ſhells, *Exp.* [67] - -	681
Lime-water made with a ſtronger Solution of Soap, *Exp.* [67.] -	1003
Potaſh and Stone-lime-water boiled *Exp.* 63. - - -	178
A Lye of Potaſh and Quick-lime *Exp.* 64 - - -	3449
Another Lye of the ſame kind *Exp.* 64. - - -	1768
Aqua fortis ſimplex in cold Digeſtion, *Exp.* 64. - -	858
And ſuppoſing its diſſolving Power to be increaſed in a digeſting Warmth, in the ſame Proportion as that of	

Oiſter-

Oiſter-lime-water, then the diſſolving Power of *Aqua fortis ſimplex* in warm Digeſtion, will be - - - - - 2184

Edinb. Novemb. 6. 1742.

POSTSCRIPT.

AS I conceive the following Hiſtory, incomplete as it is, may ſerve conſiderably to recommend the Uſe of Lime-water in the Stone; I have ſent it to be publiſhed (if you think it deſerves a Place in your Collection) as an *Appendix* to a former Paper upon this Subject.

James Litſter in *Macky's-miln*, in the County of *Fife*, aged 57, about nine Years ago, was much hurt by a ſevere Fall upon a Millſtone, and after that began to be troubled with Gravel in the Kidneys and *Ureters*: At this time he had a great Pain in one of his Kidneys, and Stoppage in his Belly, like an Iliack Paſſion: After a Clyſter he had Paſſage, and was eaſier, and the Stone or Stones paſſed into his Bladder; but he did not obſerve that he voided any with his

Urine, till a great Time after; and ever ſince this he has had all the Symptoms of a Stone in the Bladder, he has great Pain in making Urine, is not able to uſe Exerciſe, and, upon Motion, feels the Stone pricking him in his Bladder: Riding at a Trot gives him remarkable Uneaſineſs; and after it, or much walking, his Urine is generally tinged with Blood.

He has been ſubject for ſeveral Years to have his Symptoms at certain Periods exaſperated: During the Fit he is in great Diſtreſs; and his Urine, which he has an Inclination to make every two or three Minutes, comes away in Drops, with ſevere ſtimulating Pains. The Fits generally laſt three, ſometimes four Weeks, and return after an Interval of 14 or 20 Days

He took Mrs. *Stephens*'s Medicines for two Months without any Benefit, but found his Pain increaſed by them, his Stomach put out of Order, and Appetite greatly deſtroyed.

He has alſo uſed Soap for ſome time, to the Quantity of three 4ths of an Ounce a Day, but without any ſenſible Benefit.

I adviſed him, along with the Soap, to drink Lime-water made with calcin'd Cockle Shells, beginning with two *Engliſh* Pints; and if it agreed with him, increaſing the Quan-

Quantity to three Pints or more every Day.

Upon the 1ſt of *June* 1742, a few Days before he began to uſe the Lime-water, he was attacked with a ſevere Fit of Pain, and Difficulty of Urine, which laſted twenty Days, in which time he paſſed a good deal of tough Slime; but in eight or ten Days after this was over, he found himſelf eaſier than he had been for a Year before, and made his Urine more freely, and with leſs Pain.

July 2d, having uſed the Lime-water ſcarce four Weeks, he rode fourteen Miles to a Market; during the riding he felt ſome Pain in his Bladder, notwithſtanding which, next Day he was quite eaſy, whereas formerly, if he had made any Journey on Horſeback, he was ſure the Day following to be in the utmoſt Diſtreſs, and to continue ſo for ſeven or eight Days.

When he ſtoops down, or makes any ſudden Motion, he ſtill feels the Stone puſhing him in the Bladder, but not near ſo ſharp as uſual. His Urine, ſince he uſed the Lime-water, depoſites a great deal of whitiſh Sediment; and he thinks it has given him a better Appetite than he has had for ſeveral Years paſt.

From the ſecond of *July* he drank above three Pints of Lime-water every Day, and

was very eaſy till the 20th of that Month, when he had a Fit as uſual; but it laſted only 11 Days, and now it was only in making Urine that he had any Pain; and this was not ſo ſevere neither. His Belly being generally coſtive during the Fit, I ordered him *Senna-tea*, from which he had conſiderable Relief.

He continued very well all the Month of *Auguſt*, and walked upon the 20th ſix Miles in few Hours, without any Pain or Trouble; whereas for ſome Years backward, he could not walk even one Mile without much Pain.

Upon the firſt of *September*, he found his Urine much obſtructed, and had a Fit which laſted nine Days; but though his Provocations to Urine were frequent, and the Difficulty in making it conſiderable, yet after voiding a few Drops he was eaſy, and had no ſtimulating Pains. From this till the End of *October* laſt, he was as well as if he had no Stone, was able to go about his Buſineſs, from which he had been long laid aſide, and was fit for any Work that did not require great Strength. He can ride now, as well either at a Trot or Gallop as ever, and never finds any thing pricking him in his Bladder, not even when he has the Fit. From the Beginning of *July* he made no uſe of

Soap

Soap, and found no other Inconveniency than that he thought the Lime-water bound his Belly a little more for the want of it. He is ſo ſenſible of the Benefit he has had by drinking Lime-water, that he is reſolved to perſiſt in it, in hopes of a complete Cure.

I have had occaſion to order Oiſter and Cockle-ſhell Lime-water for ſeveral others, but have not yet met with an Inſtance where it was drunk to the Quantity of two or three *Engliſh* Pints a-Day, and any tolerable *Regimen* obſerved, without the Patient's finding himſelf in a few Weeks ſenſibly eaſier. When the Stone is ſmall, this will happen moſt remarkably, as was the Caſe with Mr. *Miller*, but if it is very large, even after its Surface is ſoftned, and the rough Points worn off it by the Lime-water, it is not to be imagined but that by its Bulk it muſt ſometimes give Uneaſineſs, eſpecially in making Urine; but the Patient has this to comfort him, that while he continues his Medicine, the Stone is daily growing leſs.

I ſhall only make one Obſervation upon this Hiſtory, which the moſt rigid Infidels with regard to the Diſſolution of the Stone muſt acquieſce in, and that is, Suppoſing Lime-water could not diſſolve the Stone, yet ſince it is capable of giving ſuch Eaſe

and Quiet to theſe who labour under it, whether would it not be more adviſeable for ſuch, eſpecially if advanced in Years, to reſolve upon drinking a Bottle of this every Day during their whole Life, than ſubmit to one of the moſt cruel, and at the ſame time, not the leaſt dangerous Operations in Surgery?

LXX. *The Diſſection of a calculous Perſon, by the late Mr.* JOHN PAISLEY *Surgeon in* Glaſgow.

I Opened the Body of a Youth laſt *November*, who died of a Stone in the Bladder, in which ſome Things appeared worthy of Obſervation; but as I had never ſeen him before I was called to open him, I can only relate the Symptoms that preceded, as I had them from his Parents. They acquainted me, that from his Infancy he was troubled with the Gravel, eſpecially from the Time he was three Years of Age, he then taking ſevere Fits, which laſted three, or ſometimes four Weeks, and then he was free of them for as many Months. Theſe Fits recurred frequently until he was eight Years old. In the Fit he complained of a great Inclina-

clination to make Water, without being able to make any, except a little at a Time, other whiles it forced itſelf away involuntarily; in both Caſes with great Pain about the *Os pubis* and *Anus*, and Pain and Heat in the *Penis*; ſo that he could make no Water without going to Stool, which at length brought a *procidentia ani* upon him. He complained principally of violent Pains in his Sides, eſpecially the right Side, and was continually handling and ſqueezing the Yard, which generally made his Arms ſo feeble, that by the Time the Fit was over he could make no Uſe of them. They obſerved his Fits were always worſt about the Beginning of Winter, eſpecially if the Seaſon was rainy, it ſeldom attacking him till the Rains began. He uſed to be free of them ſome Months in the Summer, had his Appetite good, only troubled with a Drought, and did not grow in Stature in proportion to his Age.

He was ſounded when eight Years old by a very able and expert Surgeon, who could neither diſcover by the *Anus* nor *Catheter* whether he had a Stone or not; after which he was free of his Fits for near a Year, having only ſome gentle Returns, which made them fancy he had no Stone; then the Fits recurred as violent and frequent as before, and thus continued till he was 15,

when

when he was cut for the Stone, and a pretty large round one taken from him, ſmooth on one Side, and rough on the other, about an Inch and a half diameter, made up of a great many *Laminæ*. The Wound healed up in about ſix or ſeven Weeks, and for three Quarters of a Year he was almoſt quite free of his Diſtemper, when again it returned with great Violence, having, beſides the Symptoms already mentioned, a great Pain in the Place where the Wound had been made when ever the Fit was upon him, and he uſed continually to croſs his Legs, and take them off again by Turns, which is not, ſo far as I know, exactly deſcribed by any Author but (*a*) *Celſus* and (*b*) *Lommius*: The firſt ſays, *Quidam etiam cùm torquentur, pedes inter ſe, ſubinde mutatis vicibus implicant*. His Urine was always thick and white, and frequently with Sand in the Bottom, and, when it ſtood any time, turned like a white Gelly. If he drank any thing liberally, it greatly augmented his Pain, eſpecially if he took Brandy or any ſtrong Liquor. A tight Bandage from the Haunches to the Arm-pits afforded him great Relief to the Pains in his Sides, which was what he complained all along moſt of.

He

(*a*) Lib. 2. cap. 7.
(*b*) Obſ. med. l. 2. § de calculo veſicæ.

He took a violent Fit in the Beginning of *September* laſt, and then for the firſt Time loſt his Appetite, his Drought increaſing, and all his other Pains, with a Looſeneſs for a Fortnight before his Death. Though he was twenty Years of Age, he was no bigger than one of ten or twelve.

Upon opening his Body all the Parts in the Abdomen appeared ſound, but much emaciated, except the Kidneys, which were very large and flaccid, and divided to Appearance into Lobes in the ſame Manner as in a *Fætus*: The one on the right Side was near five Inches long, three Inches broad, and two thick; its ſuperior convex Part was ſo intimately grown to the inferior Edge of the Liver, and to all that Part of the Colon which lay immediately above it, that it was almoſt impoſſible to ſeparate them without cutting into the Subſtance of the one or other, the whole Fat and Membranes being entirely conſumed. Upon the ſuperior Point next to the *Glandulæ renales*, there was to Appearance a larger Lobe than any of the reſt, or rather a Tumour about the Bigneſs of a Walnut, which felt very ſoft, and as having Matter fluctuating in it, in the ſame Manner as in any common Abſceſs. Upon opening the Kidney there flowed out a great Quantity of a ſlimy whitiſh Matter like

like *Pus*. The Tumor immediately ſubſided, and the whole Kidney collapſed, and looked like a thin Bag. The outer Subſtance of it being little above an Eighth of an Inch thick in moſt Places, though in no Place near to the natural Thickneſs of one either of his Bigneſs or Age; then the Tumor appeared to be only an Enlargement of one of the Productions of the *Pelvis* that ſurrounded the *papillæ uriniferæ*; the whole of the *Pelvis* being much enlarged, and its Coats very thick, as was the *Ureter* all the Way to the Bladder. The Diameter of the *Ureter* was more than half an Inch, or much about five Eighths of an Inch, full of the ſame purulent Matter as the Kidney.

The left Kidney was rather larger than the Right, being full five Inches and a half long, and much the ſame in Breadth and Thickneſs with the other, and had the ſame Appearance as to Lobes or Tumors, only the ſuperior Part was more pointed, and had a larger Tumor than the other, and contained the ſame kind of Matter. The *Pelvis* was enlarged and thickned in its Coats in the ſame manner as the other; the *Ureter* was near of the ſame Dimenſions; the Fat and Membranes, that uſually cover the Kidneys being likewiſe entirely conſumed; it was ſo firmly grown to the Part of the *Colon* that lay

lay upon it, and to the neighbouring Parts, that it was ſcarce poſſible to ſeparate them, the Subſtance of the Kidney being much of the ſame thickneſs.

The *Veſica Urinaria* was greatly contracted, cloſely ſurrounding a granulated priſmatical Stone of a whitiſh Colour, the largeſt of the Grains of which it is compoſed being ſcarce ſo big as that of an ordinary ſmall Pin-head; the Stone is about an Inch and a Quarter long, and an Inch broad in each Side; the Coats of the *Bladder* were more than a quarter of an Inch thick, and in it there was a ſmall Quantity of the purulent Matter, and ſome Sand.

LXXI. *An uncommon Tumor round the lower Part of the Bladder; by the late Mr.* JOHN MACGILL.

AN old Man, ſubject ſometimes to Fits of the Gravel, and to *Dyſuria*, who had paſſed ſome ſmall Stones, was ſeized with a total Suppreſſion of Urine, without any Fever or other violent Diſorder; Diureticks, Purgatives, Clyſters, Baths, *&c.* were tried without Relief. Hollow Catheters of ſeveral Forms were employed to e-

va-

vacuate the Water by different Surgeons, who plainly introduced the Catheter beyond the *Sphincter veſicæ*, into a Cavity from which ſometimes a very ſmall Quantity of clear Liquor ran out; but then the End of the Inſtrument was ſtopt by ſome ſoft Obſtacle, and no Urine came away, while his Bladder was gradually ſtretching to a very great Extent, and the Patient was in very violent Pain. To evacuate the collected Urine, I, by Advice of the other Gentlemen who viſited him, plunged a Trocar through the *Linea alba* and Bladder, and took away 3 *lib.* of fetid acrid Urine of the Colour of Moſs-water. The Obſtruction however at the Neck of the Bladder ſtill continuing, notwithſtanding many different Methods to relieve him, he died.

When the dead Body was examined, both the Kidneys appeared to have a flabby looſe Texture. At the Beginning of the left *Ureter* there were ſeveral bloody Spots, which looked like the Orifices of ruptur'd or diſtended Veſſels. This Ureter, at its Exit from the Kidney, was large enough to contain a Cheſnut, and the whole Ureter was dilated as far down as the Bladder.

The Bottom of the Bladder was as high as the Navel, and carried the *Septum* of the *Peritoneum* along with it. The Bladder was

was all of a black Colour, and in a gangrened State; the lower Part of it was ſurrounded with a very firm white Tumor near to the Conſiſtence of Cartilage, which was continued more than two Inches up from the *Proſtata*, being more than an Inch thick every where round. There was a particular Excreſcence which roſe forwards from the ſuperior Extremities of the back Part of this Tumor an Inch and a half, and thruſt the Coats of the Bladder before it, till they were cloſely applied to the anterior Part of the Bladder, ſo as to form a Partition between the upper and lower Part of the Bladder.

In the upper Sac of this divided Bladder there were contained a Pound and a half of a putrid bloody Liquor, and ten ſmall Stones, the largeſt of them being about the Size of a large Hazel-nut.

LXXII. *An Account of bloody Urine, from a Worm in the Bladder; by Dr.* Edward Barry *Phyſician at* Dublin, *and F. R. S.*

MR. *Thomas Hutchins*, a Gentleman who lives in *Bantry*, in the Weſt Part of

of this Kingdom, aged 50 Years, came to me for Advice on the 17th of *June* 1737, his Caſe was then attended with the following Symptoms:

About five Years ago, while he enjoyed perfect Health, and without any previous Complaint, or Cauſe which he could aſſign, firſt obſerved his Urine coloured with Blood. This Diſcharge ſince that Time has continued in his Urine, nor has he ever perceived any Intermiſſion, except when drinking very freely, he has ſometimes obſerved it clear, or but lightly tinctured, after often making Urine in large Quantities; but it ſoon afterwards returned to its uſual Standard of Colour; neither Exerciſe, Medicines nor Diet, (as near as he can judge) had remarkably increaſed, or diminiſhed the Quantity of Blood diſcharged every Day.

When I examined his Urine, it was obſcurely and deeply coloured, the Sediment which ſubſided was more intenſely red, and a great Part of it, when the Urine was poured off, was lightly coagulated. The Quantity of Blood which ſubſided in all the Urine collected in the Space of 24 Hours, without conſidering what remained mixed with it, was at leaſt equal to two Ounces. He had often obſerved, that when he divided the Urine he made at any one Time in two dif-

different Glaſſes, what he firſt diſcharged was more highly tinctured than what followed afterwards. He never voided either Stone or Gravel, never complained of any Pain in Kidneys, Ureters, Bladder or Urethra. His Conſtitution was naturally very ſtrong, which made him leſs ſenſible for ſome time of any Inconvenience from this Evacuation, and having uſed ſeveral Medicines to remove it, but in vain, he acquieſced under it, and purſued his uſual Way of Life. About three Years ago he had a Fever, and Mr. *Maxwell*, a Surgeon in the Army, who attended him in the Country, and who happened to be in Town while he was under my Care, told me he could perceive no great Difference in his Urine during the whole Courſe of the Fever. From that Time he became more ſenſible of a Decay in his Strength, which gradually decreaſed. When I viſited him he had a Swelling in his Legs, a Fulneſs and Tenſion in his Abdomen, like a beginning *Aſcites*, his Eyes and Skin tinctur'd with a yellow Colour, a Laſſitude and Difficulty of breathing on Motion, a total Loſs of Appetite, a conſtant Thirſt, with a quick Pulſe, which remarkably increaſed every Evening, not unlike a Paroxyſm of an intermittent Fever.

In theſe difficult Circumſtances I preſcri-

bed the following Regimen, with a View rather of moderating the Progreſs of the Symptoms, than with any Expectation of removing this obſtinate and unaccountable Diſorder.

After the Uſe of an Emetick, he took next Night 10 Grains of *Calomel*, and the ſucceeding Morning two Ounces of this Infuſion:

℞. *Hier. Picræ*, Dr. vi.
Rad. Rhei, Dr. iii.
——*Jalap.* Dr. i. & *ſem.*
Cochin. Indic.
Sal. Abſynth. aa. Dr. i.
Infund. frigidè in Vin. alb. Luſitanici fortioris, Unc. xvi. *Colaturæ adde*
Tinct. Myrrhæ, Unc. ii.

Thus prepared he continued to take three of the following Pills:

℞. *Gum. Ammon.* Dr. ii.
Sapon. Venet.
Chalyb. cum Sulph. p. pt. aa. Dr. i.
Rhei Elect. Pulv. Dr. i. *ſem.*
Sal. Tachen. Dr. *ſem.*
Ol. Juniperi, Gut. vi.
Teribinth. puriſſim. q. s. m. f. Pillul. xii. *ex ſing. Drachma cap.* 3. *hor. 7ma matut. & 6ta p.m. ſuperbibendo* Unc. iii. *ſeq. Decoct.*

℞. *Rad.*

℞. *Rad. Curcum.*
Rub. Tinctor. aa. Dr. vi.
Cort. Peruv. Unc. i.
Cum aq. decoct. ſub finem adde Baccar. Junip. Unc. *ſem. Colaturæ* Lib. ii. *exhibe.*

Theſe he took Morning and Evening, drinking three half Pints of *Pyrmont Spa-waters* after them in the Morning, and a half Pint in the Evening, at a proper Diſtance. Two Hours before Dinner he took thirty Drops of *Elix. Vitrioli Mynſicht.* in a Glaſs of *Old Hock.*

In a Week's Time I repeated the *Calomel* and the purging Infuſion; about four next Morning he complained of a ſevere Gripping, purged largely, lay down and ſlept till ſeven, when he made a Glaſs full of Urine of a natural Colour, and before ten he made two Glaſſes more of ſuch Urine. Mr. *Maxwell*, who viſited him that Morning, obſerving ſomething that appeared particular in the laſt Glaſs, ſent for me immediately; I poured off the Urine, and in the Bottom found a *Worm* above an Inch in Length, of the Thickneſs of the ſmalleſt Sort of Eel, and not unlike it in Shape, ending in a ſharp-pointed Tail. I received it on a China-plate, waſhed it gently with Water, which it lightly tinctured when it firſt touched it, with a

bloody *Mucus* which adhered to it. We could without a Glaſs diſcover its Mouth, Eyes, and circular Fibres, which appeared very diſtinctly when magnified. It was very firm, and of a red Colour, from whence I conclude it not to have been long dead, for in the Evening it was of a more pale Colour. His Urine continued all that Day and the next free from any Mixture of Blood, in which Time he made ſeven large Glaſſes. The ſucceeding Morning his Urine was lightly coloured, and in the Evening it was as fully loaded as uſual. Next Day it diſappeared, and returned again three Days afterwards. This Intermiſſion was gradually greater, and the Return more moderate, and the bloody Tincture in three Weeks entirely ceaſed. It was obſervable, that when the Urine was free from Blood, a Sediment like the white of Eggs ſubſided in his Urine, and continued for ſome time, though in a leſs Quantity, after the Evacuation of Blood entirely diſappeared. Afterwards by continuing the Uſe of a Chalibeat Wine, with the *Gum* Pills, taking *Rhubarb* once a Week, and obſerving an exact Regimen of Diet, all the other Symptoms were removed. It is now near a Year ſince he parted with his troubleſome Companion, and he enjoys at this Time a perfect healthy Habit of Body.

Tho'

Tho' there are ſome ſurpriſing Inſtances in Authors of the various Appearances of Worms, yet I think this ſo ſingular in its Circumſtances, that I hope you will not think I exceed the Bounds allowed in your *Eſſays*, if I endeavour to point out the Cauſe and Seat of this uncommon Diſorder, eſpecially ſince from thence a *Pathognomic* Character may be fixed, by which ſuch an Appearance, when ever it happens, may for the future with ſome Degree of Certainty be known, and a Method of Cure be more directly applied. How far the Medicines I directed contributed to the Diſcharge of this Worm, or may be ſerviceable in ſuch a Caſe, I will not determine; but whatever Succeſs attended them was more owing to Chance than Judgment.

As he had no Pain, it will be ſomething difficult to fix the Seat of this Worm; when the Diſcharge of Blood is from the Kidneys or Ureters, the Urine, though red, will be generally tranſparent; this was always obſcure, and the Sediment immediately ſubſided, which falls more ſlowly in the former Caſe; we muſt therefore fix it in the Bladder, and as the firſt Part of the Urine was more obſcure than what came off at the latter End, it was probably near its Neck. But another greater Difficulty attends this Situa-

tion; it could not ly looſe in the Bladder, with its Mouth fixed conſtantly to one Part, nor does it ſeem to have eroded any Veſſels, or produced any Wound, which muſt have been attended with *Pus*; it muſt therefore have been originally lodged in one of the laſt Ramifications of an Artery, which exhales into the Bladder, which gradually enlarging with its Size, occaſioned a conſtant oozing of Blood, in the ſame Manner as the menſtrual Diſcharge is produced, where, by a Dilatation from Plenitude, the ſame Veſſels which commonly exhale a thin Fluid, give Admittance to Blood. And that ſuch was his Caſe appears from the Procedure of the Symptoms. The immediate Diſappearance of Blood after the Diſcharge of the Worm muſt have been owing to ſome coagulated Blood lodged in the extreme Orifice, for neither could a Wound ſo immediately heal, nor a dilated Veſſel recover its Tone; when this putrified and looſened, the Diſcharge returned. This frequently happened, at length a gelatinous Humour, like the White of an Egg, only ſubſided in his Urine, which was the Serum of the Blood, which the Veſſel ſtill admitted, till its Contraction and Tone being gradually reſtored, all Appearances of that Nature ceaſed.

The Generation of *Worms* in the firſt Paſ-

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ſages is not very obſcure where a mucous *Nidus* gives them a proper Lodgment, eſpecially in weak and languid Conſtitutions, but it is ſomewhat difficult to conceive how they or their more tender *Ova* can ſafely arrive to the diſtant Veſſels of the Body. It is certain we receive many ſmall Animals and their *Ova* in our Food, which in ſtrong Conſtitutions are in the firſt Paſſages digeſted and deſtroyed, and if they or any of their *Ova* paſs through the Lacteals, and mix with the Blood, from the various Attrition and Motion in the Courſe of Circulation, they are generally deſtroyed, or may paſs off in the Secretions, and be diſcharged out of the Body. If this *Ovum* had been protruded a little farther, it would have fallen into the Cavity of the Bladder, and been diſcharged with the Urine; but it happened to ſurvive all the Shocks it met with, and to fix in the Extremity of this Veſſel, to find there a proper Seat and Nouriſhment to produce this uncommon Appearance, and though ſo ſmall in its Origin, to reduce a *Hercules* to the Weakneſs of an Infant.

Bloody Urine in moſt Caſes is owing to Stones or Gravel wounding the Veſſels, ſometimes to the Urine being loaded with acrid Salts, which may act like a Cauſtick, abrade the *Mucus* of the urinary Paſſages, and

erode the Veſſels; or in general, to whatever preſſes on their Veſſels, or determines the Blood there with a Force greater than their Reſiſtance. But as ſuch Cauſes never act equally at all times, a Diſcharge from hence of bloody Urine appears in Paroxyſms, which are more intenſe or mild, according to the Circumſtances then producing them, and are generally attended with Pain; but when the Diſcharge of the Blood with the Urine is conſtant, equal, and unattended with Pain, without any Symptoms of calcular Concretions, we may, I think, ſafely for the future aſſign ſuch an Evacuation to a Worm lodged in the Extremity of one of the Arteries.

LXXIII. *A* Dropſy, *and large* Veſicæ *in the* Ovarium; *by Mr.* JOHN PAISLEY *Surgeon in* Glaſgow.

A Widow-gentlewoman, who, when ſhe was bearing Children, had been much troubled with Coſtiveneſs and Piles, and had been much accuſtomed to Family Purgatives, which ſhe was obliged afterwards to continue, and who in Labour of a Child 18 Years ago had got an *Exomphalos*, had many Years

Years obſerved a more than ordinary bigneſs in her Belly. In *July* 1734 ſhe complained of ſome Pains in her Belly, attended with feveriſh Symptoms, which were ſoon removed. In *March* 1735, ſhe complained to me of her Belly having increaſed conſiderably for ſome time paſt, with a Weight and Tenſion in the lower Part, which hindred her to walk ſo eaſily as ſhe uſed to do. Upon preſſing this Part, I found it very much ſwelled and hard, and could eaſily diſtinguiſh a large round Body in the Cavity, which yielded to, and fled from the Preſſure, and returned whenever the Preſſure was forborn; and I could lift it up with my Hands, ſo as to be certain it was no Tumor in the containing Parts.

She had Advice of ſeveral Phyſicians, and took a great Variety of Medicines to no Purpoſe, for the Swelling continued to increaſe, ſhe waſted, and at laſt died, aged 50 Years in *November* 1735.

I thruſt a *Trocar* into the right Side of the Belly, where it was moſt prominent, and drew off 13 *Scots* Pints, or ſix and a half *Engliſh* Gallons of Water, which appeared very thin and clear as it was running out, but when all collected in a Veſſel, it had a good deal of oily Matter ſwiming a-top. Upon laying open the Body, we could ſee almoſt no Fat

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in the *Tunica celluloſa*, which in ſeveral Places reſembled the *Muſculi cutanei* of Quadrupedes. The Muſcles of the *Abdomen* were as thin as Parchment.

The *Omentum* was forced far up towards the *Thorax*, except one ſmall Production, which entred the *Hernia* at the Navel, and the whole of it was thin, with little Fat.

All the other *Viſcera* were puſhed greatly upwards upon the *Diaphragm*, by a large irregular Body, which poſſeſſed all the lower Part of the *Abdomen*. Betwixt this Body and the *Pubis* there was a large empty Bag or Sac, in which there was about half an *Engliſh* Pint of Water, where all the Water I had drawn off by the *Trocar* had been contained.

The irregular Body which I ſoon diſcovered to be the right *Ovarium*, was near a Foot long, about as much broad, and ſix Inches thick; it was compoſed of a great many ſmall Bags of different Sizes, containing a glairy Matter like Mucilage or Honey. The Coats of the larger ones were thinner than thoſe of the ſmaller, which laſt, in ſome Places, appeared a little cartilaginous, eſpecially thoſe about the middle of this Body, where the *morſus Diaboli* was fixed in Form of an irregular Bunch. The *Tuba Fallopiana* was

was much lengthned and enlarged in its Diameter.

The *Cyſtis* in which the Water had been contained, appeared to be only the external Covering of the *Ovarium*, or elſe one of the *Hydatides* ſtretched out. It adhered ſo firmly to the *Peritoneum* in the Circumference of the *Pelvis*, that though it was very thick, I had Difficulty to ſeparate them.

When this was removed, the *Uterus* and left *Ovarium* were ſeen in their natural Situation, and of the ordinary Magnitude. In the *Uterus* there was about the Bigneſs of a Hazel-nut of coagulated Blood.

The other *Viſcera* were all ſound except the *Gall-bladder*, which was not above two Inches long: The Coats of it were conſiderably thick, and cloſely contracted upon two Concretions, each as big as a middle-ſized Nutmeg, between which there was a ſmall Diſtance left, that would ſcarce admit the End of one's Finger, in which a kind of whitiſh-coloured Bile was lodged. On the under Side of the Concretion, next the Inteſtine there was a *Sulcus* that eaſily allowed what Bile was ſeparated to flow into the Inteſtine. Theſe concreted Subſtances are ſtill in my Poſſeſſion.

LXXIV.

LXXIV. *Four Caſes of the tumified* Ovarium; *by* Alex^r. Monro *Profeſſor of Anatomy in the Univerſity of* Edinburgh, *and* F. R. S.

SOme Years ago I opened the dead Body of a married Woman, aged 36 Years, who, I was informed, had always been healthy till two Years before her Death, when her *Menſes* ſtopping, ſhe imagined herſelf with Child, and her Belly having gradually turned bigger, every thing was prepared for the Birth; but after the 10th Month of her ſuppoſed Pregnancy was completed, her Belly entirely ſubſided, upon a conſiderable Diſcharge of Water *per Vaginam*; in ſome little Time after which her *Menſtrua* returned; and having undergone two or three Periods of them, ſhe was for a ſecond Time obſtructed, with the other common Symptoms of Pregnancy; at the End of the 9th Month, when ſhe had the ſame Appearance with other Women in ſuch Condition, ſhe was ſeized with bearing Pains, and continued ſeveral Days in Labour, the Fatigue of which at laſt waſted her Strength ſo much that ſhe died.

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The *Abdomen* appeared all over greatly diſtended, and at the under Part I felt thro' the Teguments, a hard ſolid Subſtance, diſtinct from all the other Parts.

The Teguments of the *Abdomen* being cut, I abſorbed with a Sponge out of the Cavity 16 Pounds of a dark-brown coloured Water, which was ſo acrid as to give a pricking Pain to my Fingers when ſoaked in it. From the Hollow of the *Ilia* I took out ſome Spoonfuls of a white-coloured *Mucus*.

The Internal Surface of the *Peritonæum*, and the external of all the Bowels were black.

A Spongy Body of a Lead-colour grew out, and received Veſſels from the *inteſtinum Ilium* and Part of the *Meſentery*.

The Spleen was ſofter than ordinary.

The Liver was grown to the *Peritonæum* in all its convex Surface, it appeared of a Lead-colour externally, but was red when cut.

I found in the Gall-bladder ſix Concretions, reſembling ſmall Bramble-berries in their black Colour and unequal Surface.

The inferior Part of the *Abdomen*, from a little below the Navel to the *Oſſa pubis*, was filled with a large Body, which was adhering to the *Peritonæum* and Guts contiguous

guous to it. The greateſt Length of this Subſtance was ſtreached tranſverſely from one *Os Ilium* to the other, and was 12 $\frac{2}{5}$ Inches, the Breadth of it from the *Oſſa Pubis* upwards, was ſeven Inches, its Thickneſs 5 $\frac{1}{2}$.

This Subſtance being removed, I ſaw the *Veſica Urinaria*, *Uterus*, and right *Ovarium*, with its *Tuba Fallopiana* in a natural State, but could not diſcover the left *Ovarium*, and the left *Tuba* was cut away with the preternatural Body above deſcribed, to which I afterwards found it firmly adhering.

The Blood-veſſels were very large and obſerveable on the Surface of that large Body, which had two ſtrong membranous Coats covering it all round, the exterior of which was eaſily diſſected off, by a cellular Subſtance being interpoſed betwixt it and the internal Membrane, which contained a great many Veſicles of different Bulk diſtended with *Mucus*, or with a firm ſteatomatous Subſtance; and in ſome of the Bags, both *Mucus* and *Steatoma* were found.

From which Structure, and the preceeding Account of the Diſeaſe and Diſſection, it is pretty evident that this preternatural Body was the left *Ovarium*, monſtrouſly overgrown and diſtended.

Hiſt.

Hiſt. 2. A Woman of 21 Years of Age, while under the violent Pains of Labour of her firſt Child, was very impatient, and toſſed from one Place to another; ſoon after, ſhe was ſenſible of a Weight in her right Groin, which, in the different Poſtures of her Body, removed always to the moſt depending Part; however, as it was not attended with Pain, ſhe did not complain of it for ſome Months, till the Weight increaſing, and a Swelling and Hardneſs being plainly felt in that Groin, ſhe asked Advice of ſome Phyſicians and Surgeons, who applied external Medicines, and gave internal ones without her being at all relieved.

A Year and a half after her Child-bed, Dr. *Alexander Dundas*, Mr. *James Robertſon* Surgeon and I were conſulted about her; her Body was at this Time waſted to Skin and Bone, as the common Phraſe is, and ſo weak ſhe could not turn herſelf from one Side to the other. Her Pulſe was very weak but quick; ſhe had no Appetite for Food, and ſhe no ſooner took any, than a feveriſh Paroxyſm was brought on, which terminated in a Sweat. Her Thirſt was perpetual, and ſcarce to be quenched. She had conſtantly looſe Stools, and paſſed green violently fetid *Fæces*. She ſleeped none in the Night, and towards the Morning had

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generally a large Sweat. Her *Menſtrua* had not appeared of a very long Time. The right Side of her Belly was conſiderably ſwelled; and we could feel with our Fingers a hard Tumor below the Teguments, extended over that whole Side; ſo that we could not be ſenſible of its terminating either at the Baſtard Ribs or *Os innominatum*. This Tumor pointed conſiderably outwards about four Inches below the Navel, and as much to a Side of the *Linea alba*, at which Place ſhe had for ſome time before complained of the greateſt Pain; here the Teguments felt thin, and a Liquor fluctuated evidently below our Fingers.

The *Prognoſis* we made will eaſily be preſumed not to be very favourable, and after acquainting the Relations of our Patient's Danger, we propoſed opening that prominent Part of the Tumor, as the only Remedy that had the leaſt Chance of relieving her, though the Conſequences even of that Operation were very uncertain. Having obtained the Conſent of all concerned, Mr. *Robertſon* made an Inciſion of an Inch long into the Part where the greateſt Appearance of *Pus* was; but we were all not a little ſurpriſed to obſerve nothing but a great Blaſt of Wind to follow the Lancet, and the Belly to ſubſide conſiderably in an Inſtant. The

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Patient complained leſs of Pain that Night; next Day a large Quantity of green fetid *Fæces* ſuch as ſhe had purged of a long time, was evacuated at dreſſing the Wound, and the two following Days the ſame kind of Matter was diſcharged, but the Quantity of it diminiſhed daily, and in the mean Time her *Diarrhœa* decreaſed in Proportion, and ſhe ſlept tolerably well all Night.

The fifth Day after the Inciſion, neither Wind nor *Fæces* came by the Wound, but it diſcharged about four Ounces of good *Pus*.

From this Time we entertained Hopes of her Recovery, for the *Diarrhœa* was quite ſtopped; her Appetite became better, her Strength increaſed, the hectic Fever and Sweatings gradually diminiſhed, and ſhe ſlept well. An analeptick Dyet of Jellies, Broaths, Aſſes Milk, *&c.* was preſcribed her, and cooling Emulſions, with gentle Opiates at Bed-time were given. The Ulcer yielded a moderate Quantity of well-digeſted *Pus*, and the hard Tumor of the *Abdomen* diminiſhed conſiderably; ſo that in two Weeks we could preſs the Points of our Fingers betwixt the Ribs and its ſuperior Extremity, and betwixt the *Os innominatum* and the lower Circumference of this hard Swelling.

After a Month's Dreſſing we diſcovered

a *Sinus* going out from the old Orifice, and extended under the Teguments about four Inches down, and outwards, which Mr. *Robertſon* cut open, by which the Surface of the Tumor being laid bare, we endeavoured to encourage the Suppuration as much as poſſible, by gentle Eſcaroticks mixed with digeſting Ballams applied to the Ulcer, and emollient ſuppurating Pultices laid over the whole Hardneſs. The Diſcharge obtained by theſe, daily waſted the Tumor; and in three Months ſhe ſeemed to be in perfect good Health, and refuſed to allow the Ulcer to be kept any longer open, though there was ſtill a Hardneſs and Swelling to be felt ſome Inches round the Orifice; ſo that we were obliged to cicatrize the Ulcer.

She continued about two Years free of all Complaints, when a new Suppuration came on; but ſhe was ſo afraid of being put to Pain by making new Openings, that ſhe would allow none of us to be informed of her Indiſpoſition, but managed it herſelf, with the Advice and Aſſiſtance of ſome good Women whom ſhe confided in; one of whom told me after her Death, that frequent Suppurations coming on, and the ſmall Orifice made by the *Pus* ſoon cloſing, her former bad Symptoms gradually appeared; and having ſtruggled in a miſerable Way about three Years

Years from the firſt beginning of her Relapſe, ſhe at laſt ſunk under the Diſeaſe, and died.

The Account the Patient gave of the firſt Riſe and Symptoms of her Diſeaſe, ſeem to lead one to judge the *Ovarium* to have been affected; and the *Ovarium* being ſuppoſed monſtrouſly ſwelled, adhering to the *Colon*, at laſt inflamed and ſuppurated, with the *Pus* eroding a Hole through the Coats of the *Ovarium*, and the contiguous adhering *Colon*, will readily account for all the *Phænomena* in this Caſe, which at firſt View ſeem attended with ſo many Difficulties.

Hiſt. 3. —— Aged 26 Years, of a delicate weak Conſtitution, in bearing her fifth Child, was put to moſt violent Pain, by her Midwife pulling away the *Placenta* indiſcreetly; which Pain however, after ſome Hours, abated conſiderably, and continued moderate till the ſecond Day after, when ſhe complained of a moſt racking deep-ſeated Pain of her left Groin; there was no Hardneſs, Swelling or diſcolouring to be obſerved: When ſhe attempted to ly on the left Side, the Pain was greatly increaſed. Her Pulſe was quick, but weak. Her Thirſt was exceſſive: Her Belly coſtive, and the Quanti-

ty of Urine ſmall. The *Lochia* were in ſufficient Quantity; ſhe was leaner and weaker than ordinary, and often complained of being faint.

Emollient eccoprotic Clyſters were injected. She had Almond-milk given for Drink, and farinaceous Slabbs for Food. When faint ſhe took a Spoonful of a cordial Mixture. The pain'd Part was frequently fomented with Emollients.

The Symptoms ſtill increaſing, I obſerved on the eight Day a large Tumor below the Muſcles extended from the *Os Pubis* to the ſuperior Part of the left *Os Ilium*, and the Skin above it of a red Colour. Her Strength by this time was ſo much ſpent, ſhe could ſcarce turn herſelf in her Bed. Lying on either Side tortured her ſo much, that ſhe was obliged to ly conſtantly on her Back. She breathed with great Difficulty, and frequently fainted. Since therefore no Hopes of reſolving the Tumor appeared, I applied a ſuppurative Cataplaſm all over it, continued her Cordial, and every Evening gave a ſmall Doſe of *Opium*.

She continued in this miſerable and extremely weak Condition for ſome more than two Weeks, and at laſt was attacked with a Vomiting and *Diarrhæa*, which continued two Days, till the purulent Matter of the Tumor

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eroding the Teguments about two Inches above the Ring of the external oblique abdominal Muſcle, was diſcharged in a conſiderable Quantity; after which the vomiting and *Diarrhæa* ſtopped, the Fever diminiſhed, the Pain abated, and ſhe began to ſleep calmly.

The Orifice of the Ulcer being ſmall, I propoſed to inlarge it by cutting, which ſhe abſolutely refuſed to ſuffer, as ſhe had done alſo my opening the Tumor, when I firſt was ſenſible of Matter fluctuating in it. A Tent charged with *Baſilicon* and *Red Precipitate* was introduced, and the former Cataplaſm continued; ſome Days thereafter, two other ſmall Holes were made by the acrid *Pus* at a little Diſtance from the former, which gradually were inlarged by the conſtant Uſe of the *eſcharotick* Powder; the Liquor diſcharged by theſe Orifices was ſometimes purulent, but much oftner was glairy *Mucus*, reſembling the White of an Egg.

The Orifices being kept open, and the Suppuration encouraged, by continuing the Method of Dreſſing mentioned, the Hardneſs gradually melted down, the bad Symptoms went off, and ſhe recovered Strength, but for ſeveral Months was often attacked by violent aſthmatick Fits, from which the *Oxy-*

mel pectorale of the *Edinburgh* Diſpenſatory never miſſed to relieve her: Since this Time ſhe has enjoyed as good Health as ever, and has born ſeveral Children.

The Manner of this Tumor's Increaſe, its being confined to one Side, without any ſtopping of the *Lochia*, when the Inflammation was violent, and without any Diſcharge of *Pus per vaginam* when the Tumor ſuppurated, and the Liquor evacuated by the Orifices of the Teguments being moſtly *Mucus*; all conſpire to point out the *Ovarium* and not the *Uterus* to have been affected.

Hiſt. 4. In a Letter from Mr. *Hugh Sutherland* Surgeon, now Phyſician at *Kirkwall* in *Orkney*, I was deſired to give Advice in the Caſe of a Gentlewoman, who ſix Weeks after being delivered of Child, complained of a Pain and Hardneſs at the lower Part of the right Side of the Belly; which afterwards ſpreading upwards, and to the left Side above the *Os Pubis*, gave her great Trouble. Her *Menſtrua* had not appeared for ſome Months after Child-bed; Her Urine was in ſmall Quantity. She was conſtantly hectic, had no Appetite for Food, and was reduced to great Weakneſs, and to Skin and Bone.

Mr.

Mr. *Sutherland* informed me that an hyſterick Plaiſter, beſmeared with *Ol. ſuccin.* had been applied to the Tumor, and that it was afterwards embrocated with a Liniment compoſed of *Ung. Alth. Sp. Sal. Ammon. Ol. Succin & Anis.* She had taken the ſtomachic Bitters ſome time, and uſed *Sal Prunel.* diſſolved in her ordinary Drink. By theſe Medicines her *Menſtrua* were brought to be regular, the Urine came to be in good enough Quantity, and the hectick Fever ſeemed to be gone: But her Appetite ſtill continued bad, and after eating ſhe was ſick and uneaſy. Her Belly was ſo coſtive, ſhe ſcarce had a Stool once a-week. She ſtill was weak and lean. The Pain, Hardneſs and Tenſion of her Belly increaſed evidently. Tho' ſhe ſlept much both in the Night and Day, yet ſhe neither was ſtrengthned nor refreſhed, but always awaked weary and fatigued.

In anſwer to this Account, I wrote Mr. *Sutherland* that I ſuſpected the right *Ovarium* to be tumified; and in caſe my Suſpicion was juſt, probably he would, upon Enquiry, find that the Progreſs of the Tumor had been much in this Manner. Before any Swelling and Hardneſs diſcovered themſelves, our Patient was ſenſible of a Weight, which changed its Seat to dif-

ferent depending Parts of the *Pelvis*, according to the different Poſtures of her Body. The Increaſe of the Tumor was from below upwards, and when once it became ſo large as evidently to make the Teguments of the Belly prominent, the Tumor was fixed and would ſhift Place no more. If there was no Suppuration yet begun, the Pain would be but obtuſe, without any external Redneſs or Hardneſs in the Teguments, and without Fever, Thirſt, *&c.* If a Suppuration was begun all theſe Symptoms which I juſt now ſuppoſed her free of, would be appearing.

On the Suppoſition of no Suppuration I was of opinion the Tumor ſhould, if poſſible, be reſolved, and therefore propoſed to foment the ſwelled Part frequently with an aperient reſolvent *Fotus*, and to keep a Cataplaſm made with the emollient Farines, a conſiderable Proportion of *Galbanum* diſſolved in the Yolk of an Egg, ſome *Ung. Alth.* and the Liquor for Fomentation, conſtantly applied to the Part. In the mean time ſhe ſhould continue the Uſe of the ſtomachic Bitters, with Pills compounded of the ſtinking Gums, and a ſmall Proportion of Aloes, and ſhould be ordered the lighteſt, eaſieſt digeſted, and leaſt heating Food; ſhould drink Whey, Barley Ptiſan, or Wine and Water.

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If the Symptoms of Suppuration were come on, it ought to be forwarded as much as Art could.

Some Months after I had ſent this Letter, an Anſwer was delivered to me from Mr. *Sutherland* by my Patient's Husband, acquainting me that the Progreſs of the Tumor had been preciſely in the Manner I had deſcribed, but without any of the Symptoms of Suppuration. That this lucky gueſſing at Symptoms I had not been informed of, and of which they had not taken the leaſt Notice before my Letter, had given our Patient great Courage, and had made her punctually obſerve the Directions I had mentioned, by means of which the Tumor and Pain were altogether removed, without any obſervable Evacuation of Matter any way, and my Patient was healthy and ſtrong.

Since her Recovery ſhe has born Children, and continues in a good State of Health, only that ſhe is ſenſible of what ſhe calls a Weakneſs in that Side, and after travelling and riding ſhe feels Pain where the Tumor was formerly.

LXXV.

LXXV. *Ulcers from* Dracunculi; *by Meſſieurs* ROBERT HUTCHESON *and* GEORGE FORBES, *Practiſers of Phyſick and Surgery in the Iſland of* Bermuda.

THE Hiſtories of the *Dracunculi*, *Indian* or *Guinea Worms*, which we have ſeen, not being related ſo accurately as we think can aſſiſt young Practiſers to manage Patients under that Diſeaſe, we ſend you the following Caſe, hoping it may be of ſervice to others who may practiſe in this Part of the World.

A Boy lately brought from *Guinea*, about 15 Years of Age, of a thin Habit of Body, complained, while on a Voyage from *Jamaica* to this Place, of ſharp Pain on the Outſide of the *Tibia*, where there was Hardneſs and Swelling, and Appearance of Suppuration. We took eight Ounces of Blood, and purged him with *Manna* and *Cremor Tartari*, rubbed the Part with *Ung. Alth.* and gently rolled it up. The Boy complained much of Pain all that Day, and was reſtleſs, drowthy and feveriſh all Night. Next Morning the Tumor, Tenſion and Inflammation of the Leg, were increaſed; we embro-

brocated it again with the Ointment, and applied a Cataplaſm made of the *Farin. Sem. Lin. Fœnugræc.* and *Ung. Alth.* After dreſſing it thus two Days the Suppuration was compleat, and an Inciſion two Inches long was made into the Teguments of the Abſceſs, from which two Spoonfuls of *Pus* and Blood were diſcharged. The Sore was dreſſed with *common Digeſtive*, with a Pledgit of *Ung. Baſilic. flav.* and *Diachyl. cum Gumm.* Plaiſter over it. That Night the Boy was much more eaſy and ſlept. Next Day the Sore ſeemed to be digeſting very well, but we obſerved a Subſtance about the Size of a common Silver Probe, of a pure white Colour, like a Tendon, hanging out from the ſuperior Part of the Aperture. Upon gently drawing this Subſtance we extended it to three or four Inches in length, and then judging what the Diſeaſe was, rolled it upon a ſmall Pipe of Lead, and ſecured it with a Thread. Next Day we made a Purchaſe of eight Inches, and put in a Piece of Sponge-tent to prevent the Contraction of the Lips of the Sore. At the third Dreſſing the Boy complained of his Toes, and his *Metatarſus* was ſwelled. This Tumor was treated in the ſame Manner as the former, but did not ſuppurate ſo kindly, for upon opening it a black Ichor mixed with Blood only

only was diſcharged, and the Leg became oedematous. We met at the ſame time with rough cold Weather, which affected the Boy much, and the Leg ſeemed to threaten a Mortification. We fomented it well, put a Cloth wet in Spirit of Wine over it, and rolled it from the Toe to the Ham. We repeated the Fomentations in the Evening, and obſerving ſome watery Bliſters round the Orifice in the Foot, with a livid Colour of its Lips, we ſcarrified it all round, dreſſed it with warm *Ol. Terebinth.* put the Cloth with Spirits and the Bandage over it, and gave the Boy a Cordial.

Next Morning the Sore looked freſher, the Scarifications began to digeſt, and we diſcovered the Extremity of another *Dracunculus*, but ſo firmly fixed, that we durſt not venture to draw any of it out, but were contented to ty a Thread round it. We put the Boy on a ſtrict Regimen of Diet, allowing him no ſalt Meat or Spirits, gave him Laxatives ſometimes, and continued our former Dreſſings. The Digeſtion of the Wounds going well on, the Purchaſe of the Worms became eaſier, of the one in the Leg we had three Yards and a half, but after bringing out ſix Inches of the one in the Foot, we broke it by extending it too quickly, it retreated and diſappeared; Fluxion, Swel-

Swelling, Inflammation and violent Pain, immediately came on, and next Dreſſing there were Tumefactions at the End of the *Fibula*, on the firſt Joint of the great Toe, and two on the muſcular Part of the Leg. We treated them all in the ſame way the firſt had been managed, and in eight Weeks we extracted from the different Ulcers thirty Yards of the *Dracunculus*, after which the Ulcers healed, and cicatriſed with no Trouble. We thought it however proper to give our Patient a Courſe of *Æthiops Mineral*, with gentle Purgatives now and then, by which Management he became a ſtrong jolly young Lad.

LXXVI. *A Deſcription of the* African *Diſtemper called the* Yaws, *with the true Method of Cure; by* —— (*a*).

THE *Yaws* is a Diſtemper *epidemical*, or rather *endemical* to *Guinea* and the hotter Climates in *Africa*, ſeldom failing to attack each Individual of both Sexes one time or other in their Lives, but moſt com-

(*a*) The Gentleman by whom this Paper was communicated, not having obtained the Author's Conſent to put his Name to it, would not allow us to inſert it.

commonly in Childhood or Youth; it makes its firſt Appearance in little Spots on the Cuticle, level or ſmooth with the Skin, at firſt no larger than the Point of a Pin, which increaſe daily, and become protuberant like Pimples; ſoon after the Cuticle frets off, and then, inſtead of finding *Pus* or *Ichor* in this ſmall Tumor, you only find white Sloughs or *Sordes*, under which is a ſmall red *Fungus* growing out of the *Cutis*, increaſing gradually to very different Magnitudes, ſome leſs than the ſmalleſt Wood-ſtrawberry, ſome as big as a Raſpberry, and others even exceeding in Bigneſs the largeſt Mulberries, which Berries they very much reſemble, being knobbed as they are. While they are coming to this Height, the black Hair that grows out of the Parts now covered with the *Yaws* changes gradually white; I do not mean appears white by the *Ichor* of the *Yaws* drying upon it, as all the Skin does towards the End of this Diſtemper, but the Subſtance of the Hair itſelf is changed from black to a tranſparent white, like the white Hairs of old Men.

I think it impoſſible to calculate the exact Time that the Diſtemper requires to go through theſe different *Stadia:* Some Conſtitutions may be more adapted to produce this nauſeous Diſtemper, or to receive it from

from others by Infection, nay the ſame Conſtitution may be apt to receive or produce it at one Time more than at another; and if it is produced by external Infection, the Degree and Quantity of Infection may haſten or retard the Symptoms. This I know by Experience, that Negroes who were luſty, in good Plight, and had full Nouriſhment allowed them, in a Month after diſcovering the white Spots, have had ſeveral *Yaws* as big as a Mulberry; and in Negroes that were low in Fleſh, and have had but a poor ſcanty Diet, in three Months time none of the *Yaws* have exceeded a common Strawberry in Size.

The *Yaws* appear indeterminately on all the Parts of the Body, but the moſt and biggeſt are generally on the Groins, about the Privities and *Anus*, in the Armpits and Face. When the *Yaws* are very large, they are few in Number, and when many in Number, they are ſmall in Size. All this Time the Patient is in good Health, does not loſe his Appetite, and ſeems to have no other Uneaſineſs but what the Naſtineſs of the Sores occaſion, for they are not painful except they are touched too roughly. This is the natural Appearance of the Diſtemper, when left to itſelf, and in this State it will continue a long Time, without any ſenſible Alteration

teration; and what might be the Conſequence in Time, I cannot pretend to tell you, whether it might not conſume itſelf, and cure as ſoon as the peccant Matter is thrown entirely out and exhauſted? Or, whether theſe *Funguſes* might not turn corroſive Ulcers, and at the ſame Time affect the Bones with *Nodes*, *Exoſtoſes* and *Caries*, as it does when the Cure is attempted without Succeſs? Or, whether it might not alter the Diameter of all or ſome of the Excretory Ducts of the miliary Glands, and adapt them to excrete a Fluid more viſcid than the natural Sweat, or inſenſible Tranſpiration, which drying on the Skin would render the Patient ſcorbutick or ſcabby, that is, leprous. This I imagine to be the moſt probable Conjecture, and that as ſoon as the Funguſes are dry, the Infection is exhauſted. This Diſtemper being infectious, it is the Buſineſs of the Negro's Maſter to ſeek for a Cure, as well for the ſake of the Negroe affected, as for himſelf, Family, and other Negroes on the Eſtate, that have not had it before, who are in danger of being infected.

The *Yaws* do not prove often dangerous, if the Cure is undertaken skilfully at a proper Time, and the Patient has not undergone any Courſe of Phyſic for them before; but if the Patient has been once ſalivated,

or

or taken any Quantity of *Mercury*, and the Skin once cleared, and they appear again, they are always very difficult to cure, and often incurable; and indeed I am of opinion, that the following Train of terrible Symptoms owe their Original as much to the untimely and unskilful Uſe of the *Mercury*, as to the Diſtemper itſelf; I am induced to this Belief by theſe Reaſons:

All the Negroes that have had the Yaws in *Africa*, and have been cured there, never have them again here, or any bad Symptom that ſeems to proceed from them; and, in the Courſe of nine Years Practice here, I never had any Patient that relapſed when I was firſt employed, nor ever loſt one, tho' I have cured Numbers of both Sexes, and of all Ages. Nor is it to be admired that the *Africans* ſhould underſtand their Country Diſtemper better than we *Europeans*, they probably have had above three thouſand Years to gain Experience of it by Obſervation, we have not had one hundred Years.

As ſoon as a Negroe is perceived to have the *Yaws* coming out upon him, he muſt be removed to a Houſe by himſelf, or, if you cannot be ſure whether it is the Yaws or not, ſhut him up ſeven Days, and look upon him again as the *Jews* are commanded to do with their Lepers, *Levit.* Chap. xiii.

and in that Time you may commonly be certain. As ſoon as you are convinced that the Eruptions are really the *Yaws*;

℞. *Flor. Sulphur.* Scrup. i.
Camphor. (*in Spt. Vin. ſol.*) Gr. v.
Theriac Andromach. Drach. i.
Syrup. Croci, q. s. m. ft. bolus.
Quaque nocte horâ ſomni ſumendus.

Repeat this Bolus every Night for two or three Weeks, or till the *Yaws* are at their Height, which is eaſily diſcovered by their being at a Stand, neither increaſing in Size or Number; then is the Time to throw your Patient into a gentle Salivation by *Calomel*, without any further Preparation of the Body. Give the *Calomel* in ſmall Doſes at a Time, that it may neither vomit nor purge. I never exceeded five Grains at a Time in Pill or Bolus, and repeated the Doſe once, twice, or thrice a Day, as I found the Patient could bear it, and never deſignedly raiſed the Salivation to above a Quart ſpitting in 24 Hours: Very often by the Time you have got the Salivation to this Height all the *Yaws* will be covered over with a dry ſcaly Cruſt or Scab, which, in Patients that have been full of them, makes a very terrible Figure. Theſe Cruſts or Scabs fall off daily in ſmall white Scales, and in ten or twelve Days leave the Skin ſmooth and clean:

clean: Then I leave off giving any more *Calomel*, and let the Salivation go off gradually of itſelf. After the Salivation, ſweat them twice or thrice in a Frame or Chair with Spirit of Wine, and preſcribe the following Electuary:

℞. *Æthiop. Mineral.* Unc. i. *ſem.*
Gum. Guajac. Unc. *ſem.*
Ther. Andromach.
Conſer. Roſar. rubr. aa. Unc. i.
Ol. Saſſafraſ. Gutt. xx.
Syrup. Croci, q. ſ. m. Electuar.
Capiat Dr. ii. *mane & veſperi.*

I likewiſe order them to drink the Decoction of *Guajacum* and *Saſſafras*, fermented with Syrup or Molaſſes, for their conſtant Drink, while they take the Electuary, and to be continued for a Week or a Fortnight after the Electuary is done.

Sometimes after all the other *Yaws* are fallen off, the reſt of the Skin is clear, and the Salivation is over, there remains one large *Yaw*, high knobbed, red and moiſt; this is commonly called the *Maſter-yaw*, and has coſt many a Negroe his Life, by the Practitioners believing that this required another and another Salivation; in reality this requires no more than being deſtroyed by a gentle Cauſtick, or mild Eſchoratick, about an eighth or tenth Part of an Inch lower than

the Skin, and then it will cure up as eaſy, and as ſoon as any other Ulcer of the ſame Bigneſs and Figure. I commonly have uſed *Præcip. rubr. Allum. uſt. aa. p. æ.* for my Eſcharotick, digeſted with *Ung. Baſilic. flav.* Unc. i. *Præcip. rubr.* Dr. i. and cicatrized with Lint preſſed out of Spirit of Wine, and with the vitriol Stone.

After the *Yaws* are cured, ſome Patients are afflicted with Carbuncles in their Feet, which ſometimes render them uncapable of walking, or, if they do walk, it is with much Pain.

This Diſtemper ſeems to be owing intirely to the *Yawy* Matter being confined by the Hardneſs of the Cuticle in the Soles of their Feet, by continually walking barefooted. Sometimes the whole Sole of the Foot will be affected, and they cannot bear any touching it, and at other Times there is only one Spot no bigger than an *Engliſh* Shilling. In time the Pain brings on an Inflammation and Suppuration, and the Patient is eaſy; it ſeems to be cured, and often is ſo, by the whole *Yawy Fungus* being conſumed by the Suppuration. At other times, in five or ſix Weeks, as the Skin hardens, the Pain, Inflammation, *&c.* begin again, and thus the Symptoms go and return for Years, till either the *Fungus* is conſumed by

by the frequent Suppurations, or deſtroyed by Art. Many *Noſtrums* the Planters and Negroes try for this Malady, but the only effectual Method is by bathing and paring to deſtroy the Cuticle, and then proceed as in the *Maſter-yaw*. The gentle Eſcharoticks are to be preferred, eſpecially here, and all imaginable Care is to be taken to avoid the Tendons and *Perioſteum*.

In Children under ſix or ſeven Years old, who cannot be ſuppoſed to have Senſe enough to go through a Salivation, at the proper Time of ſalivating I begin to give them a Grain or two of *Calomel* in white Sugar once a Day, once in two Days, or once in three Days, ſo as only to keep their Mouths a little ſore till the *Yaws* dry, and falling off in white Scales, leave the Skin clean. This ſucceeds always, but requires a longer Time than in Adults.

I have thrice had the Mother with her ſucking Child under my Care for the *Yaws*, both Mother and Child were full of them. Two of the Children I cured by curing their Mothers, without giving the Children any Medicine but what they received from their Mothers in ſucking their Milk; the third Child, who was both bigger and older than the former two, when his Mother was well, his *Yaws* were dry, and in one white Cruſt

or Scab, but did not ſcale off, and I was obliged to finiſh his Cure with three or four ſmall Doſes of *Calomel*, and a Courſe of *Æthiops*. I have been well informed, that even in Adults the *Æthiops Mineral*, given in large Doſes for three or four Months, will make a perfect Cure: I never tried it, becauſe it requires ſo long a Time, and there is no truſting a Negroe to take his Medicines himſelf, and the Planters neither care to loſe their Labour, nor to take the Trouble of attending them ſo long; but I am convinced it would ſucceed with Safety.

Some may be ſurpriſed, that in my *Mercurial* Courſe for this Diſtemper, I neither prepare the Body with blooding and purging before the Salivation, nor purge after it. As to the firſt, the Diſtemper is cutaneous, or rather the Skin is the natural Emunctory by which the peccant Humour is thrown off in this Diſeaſe, by a very extraordinary and preternatural Criſis. All that I mean by a preternatural Criſis is, that the Cauſe of this Diſtemper, like the Small-pox, can never be concocted, ſo as to go off by any of the natural Secretions; and the Funguſes here are as natural as the Puſtules in the Small-pox; for if you ſalivate your Patient before the *Yaws* are at their Height, the beſt that you can expect is their appearing again ſoon after

after the Salivation: And what can be expected from bleeding and purging, but retarding the Yaws in coming out to their Height, and probably carrying off ſome Fluids that are abſolutely neceſſary to Nature in her Operation, or perhaps intimately mixing the Cauſe of this Diſtemper with the Fluids, ſo that an intire Separation can never be procured afterwards?

And as to purging after Salivation, if the morbifick Matter is intirely exhauſted, what Occaſion is there for Purges? can we propoſe carrying the Matter off by the Inteſtines, which naturally ſeems to go off by the Yaws themſelves? Is it not more probable, that ſome ſmall Particles that are left about the Skin, might be waſhed off by the natural Perſpiration and Heat, which by purging may again be returned to the Blood, and create freſh Diſorders? Add to all this, the *Maſter-yaw*, when in full Bloom, is merely topical, and eaſily cured by Topicks, tho' it contains Infection enough to produce the *Yaws* in hundreds by Inoculation.

The venereal Diſeaſe and the *Yaws*, as far as I have deſcribed the latter, are very diſtinct Diſtempers, but the Symptoms, in conſequence of the *Yaws* ill-cured, coincide ſo exactly with the Symptoms of an inveterate *French-Pox*, and too promiſcu-

ous Copulation of the Negroes renders them ſo liable to the venereal Taint, that in moſt Caſes it will be very difficult, if not impoſſible, to diſtinguiſh them, eſpecially if the Patient has had both Diſtempers at any time in his Life before his preſent Complaints.

The Symptoms are, violent Pains in the Limbs, even nocturnal, which with ſome are attended with *Nodes* and *Exoſtoſes*, in others with Ulcers, which render the Bones carious. I ſhall not pretend to determine which Diſtemper they belong to, but I think if a Patient, that never had any Symptoms of the venereal Diſeaſe, and had the *Yaws*, was to labour under theſe Symptoms, I ſhould make no doubt of their proceeding from the *Yaws*, and more ſo, if theſe Symptoms did not yield to the Method of Cure that either palliates or cures the *Pox*, but rather irritates and increaſes them. I ſhall give an Obſervation or two, where I think the Caſe proceeded from the *Yaws*, and leave you to judge for yourſelf.

In the Year 1727 I was deſired to look upon a young Negroe Man, long afflicted with Ulcers in his right Leg and Foot, occaſioned, as was ſuppoſed, by the *Yaws* being ill-cured in his Childhood; he ſeem'd to be healthy in every other Reſpect, and had undergone ſeveral Salivations and Courſes of Phy-

Phyſick unſucceſsfully. I found two of the *metatarſal* Bones conſumed, and the other three carious, the *Os calcis*, and the lower *Epiphyſis* of the *Tibia* were likewiſe carious. I told the Lady to whom he belonged, that it was not in my Power to ſerve him; theſe Bones would rot, and not exfoliate, and if I proceeded to Amputation, as they deſired, I either ſhould not be able to cure up the Stump, or if I did, he would not long ſurvive it: However, upon the continual Entreaties of both the Miſtreſs and Negroe, I at laſt condeſcended to amputate his Leg.

I bled and purged him twice or thrice, and made him an Iſſue in the oppoſite Leg and one in each Arm. Some Days after they were digeſted, I took off his Leg at the uſual Place, and cured the Stump with all the Eaſe imaginable, and he was very glad to walk about on his wooden Leg. About a Month after the Stump was perfectly cicatrized, he was ſeized with a Fever, and in a few Days after, with a violent Pain and Inflammation in his Thigh and Knee of the amputated Leg; in a Fortnight after the Approach of the Fever, I found a Fluctuation of Matter in his Ham, and opening it by Inciſion, diſcharged a Pint of Matter at firſt. As the Impoſthume digeſted, the Fever

ver wore off, and he recovered; he is now alive and in Health, but keeps the Inciſion ſtill open as an Iſſue.

A young Woman of a good Education came from *England* here, as a School-miſtreſs to a Gentleman's Daughter; ſome time after, ſhe married an Overſeer, who gave her the *Yaws*; as ſoon as ſhe perceived the Diſtemper, being much frightned, ſhe went to a Planter, who uſed to cure a great many Negroes; there was then but juſt *Yaws* enough to ſhow that Diſtemper. He immediately ſhut her up in the Hot-houſe, (as they call it here), and that Night anointed her with the mercurial Unction, according to *Serjeant Wiſeman*'s Proportion of the *Quick-ſilver*. This once anointing threw her into a deep Salivation, which laſted between ſix and ſeven Weeks: Four Weeks of that Time ſhe could not ſpeak a Word, and the *Saliva* was deeply tinged with Blood. After the Salivation ſhe ſeemed perfectly well, ſoon recovered her Strength, and engaged to go to *England* with a Gentleman's Lady as her Chamber-maid, and accordingly imbarked in *May* or *June* 1728.

Some Weeks after ſhe arrived in *London*, ſhe was attacked with violent Pains in her Arms and Legs, and applied herſelf to a Surgeon or Apothecary of her Acquaintance, who

who gave her many Medicines to no Purpoſe; for while ſhe was under his Care, an Ulcer broke out in her Leg, and another in her Arm: Upon this her Money beginning to fall ſhort, and thinking ſhe had a better Chance of gettting well in a Country where her Diſtemper was known, than where they knew little of it, (at leaſt thoſe ſhe applied to) ſhe got a Paſſage to this Iſland again.

In *Auguſt* 1729, ſhe came to me begging my Aſſiſtance; ſhe was really an Object of Charity, and I promiſed to give her my utmoſt Endeavours to ſerve her, without the leaſt Proſpect of Gain. The Pains of her Limbs then continued ſevere, and ſhe had five or ſix Ulcers in different Parts of her Arms and Legs, all covered with an *Hyperſarcoſis*.

I told her ſhe muſt be very ſincere in anſwering what Queſtions I asked her; for as her Husband had given her the *Yaws*, he might as well have given her the *venereal Diſeaſe*, and that I ſhould have more hope of curing her, if the preſent Symptoms proceeded from the laſt, than if they were the Conſequence of the firſt. She told me ſhe never had any venereal Symptom in her Life, either before ſhe had the *Yaws* or ſince, that a few Days before ſhe diſcovered ſhe had the *Yaws*, her Husband left her, and went

went to Sea his firſt Profeſſion; that ſhe had never ſeen him ſince nor converſed criminally with any other Man. Her ſincere and ſenſible way of anſwering every Queſtion I could ask her, as they occurred to me, and the good Character ſhe bore among her Acquaintances, as well as its being her Intereſt to tell me the Truth, which ſhe might without any Shame, convinced me ſhe was ſincere, and had no Deſign to deceive me, or ruin herſelf.

I immediately dreſſed the Ulcers with gentle Eſcharoticks, to deſtroy the *Hyperſarcoſis*, and put her into a Courſe of *Æthiops*, with the Decoction of the Woods in Lime-water, and gave her gentle Catharticks twice a Week with *Mercurius dulcis*. After a Month or ſix Weeks ſpent in this Method, I found it had no Effect; for after the *Funguſes* were conſumed, the Ulcers ſeemed to digeſt a few Days, and then gleeted again, and never in the leaſt contracted. I then threw her into a gentle Salivation with *Calomel*, deſigning to keep her long in it gently, after ſhe had ſpit about a Quart a Day for four Weeks, finding it not anſwer, the Ulcers inlarging, and the Pains becoming more violent, I was reſolved to let it go off: But at Night there fell a great Rain, and the Room not being tight in the Roof, was very wet. The next

Day

Day the Salivation ſtopt, and ſhe had a Fever for a Fortnight, which at length went off, and left her ſo weak and emaciated, that I was affraid ſhe would die conſumptive at laſt.

I then put her into the Milk Diet and ordered her a Decoction of *Sarſaparilla* and *China* Roots, to be drunk for her conſtant Drink, with one third Milk. In about eight or ten Weeks ſhe recovered her Strength and Fleſh, and was adviſed by ſome of her Neighbours to uſe a Diet-drink that a certain Negroe made, which they ſaid had cured Numbers in her Caſe, after all other Means had failed. This ſhe uſed ſix or ſeven Months, and dreſſed the Ulcers with *Tincture of Myrrh*, bathing them every Dreſſing with warm Lime-water: But both they and her Pains increaſed; the Bones became carious in every Ulcer, and ſhe lingred under the Diſtemper to the End of the Year 1734, and died.

When I came to this Iſland, it was the Practice here, aſſoon as the *Yaws* appeared, to give the Patient 25 Gutts of a Solution of two Drachms of *Mercur. ſublimat. corroſiv.* in eight Ounces of ſtrong Rum in the Morning, drinking warm Water after every Puke, and they would vomit and ſpit all the Forenoon. This Doſe they repeated every

very Morning, increaſing the Quantity five Gutts every Doſe they took, in a few Days they were ſeemingly well: But I obſerved that moſt that had been treated after this manner, either broke out again or in Proceſs of Time complained of gnawing Pains in their Bones, or were ſubject to Ulcers in ſeveral Parts of their Bodies. The Diſeaſe at its ſecond Appearance was long of coming to an Height, and required a longer Courſe of Mercury to clear their Skin; and ſometimes after all they would relapſe a third and fourth time.

Of theſe Patients that were affected with Ulcers, I have ſucceeded with ſome by Salivation, and long Courſes of the *Æthiops*, with the Decoction of the Woods in Lime-water, many I have been foiled in, and never been able to cure, but left them, I think, rather worſe than I found them, to linger out their Days miſerably. Nor can I pretend to better Succeſs in thoſe that have complained of Pains in their Bones, they have generally ended in *Nodes*, *Exoſtoſes*, and *Caries*, and the Bones of the Arms and Legs break without any external Violence.

A Negroe Man called *America* belonging to Sir *William Stapleton*, after having had the *Yaws*, complained of Pains in his Limbs, and had been uſeleſs in the Plantation for

nigh

nigh twenty Years, moſt of his Bones being full of *Nodes* or *Exoſtoſes* and *Caries*. In the Year 1733 his *Os humeri* broke in the middle, without any external Accident. I reduced and dreſſed it as a common Fracture. About ſix Weeks after, when the *Callus* ought to have been grown ſtrong, I found the Ends of the Bones move eaſily one on another; and upon a gentle Extenſion of his Arm, the Ends of the Bones were a full Inch diſtant from each other. In about twelve Months more, the *Os humeri* was conſumed entirely within an Inch of the *Scapula*, and about the ſame Diſtance from the Elbow. Soon after this he died tabid.

It is worth while to compare the Deſcription of the *Leproſy* among the *Jews* in *Chap.* xiii. of *Leviticus*, with the Account which I have here given of the *Yaws*; the two Diſtempers ſeem to have a great Reſemblance to each other.

LXXVII. *An Eſſay on the Cauſe of animal Heat, and on ſome of the Effects of Heat and Cold on our Bodies; by* JOHN STEVENSON *M. D. Fellow of the College of Phyſicians at* Edinburgh.

THo' I imagine, that in the following Pages, there are ſome Pieces of *Theory* new opened, or ſet in a clearer Light than they have hitherto appeared in; yet, if I had not been fully perſwaded that the *Practice of Medicine*, (about which only I am anxious) was to receive ſome Improvement from them, I ſhould never have been prevailed upon to put into your Hands ſo incomplete and diſorderly a Collection. But conſidering that this is your laſt Volume, and that I ſhall probably never be at Pains to make the Experiments I purpoſed to make, and finiſh the Parts I had chalked out, I give you theſe Papers, looſe as they are, to be purſued and perfected, if they deſerve it, by thoſe who have more Leiſure and Genius for ſuch Enquiries.

A Part of the Thoughts on *Animal Heat* were read in our Philoſophical Society; thoſe on the *warm Pediluvium* were likewiſe

wiſe read there: The intermediate and ſucceeding Articles relating to theſe Subjects, are Scraps of a Project to complete *the natural Hiſtory of the human Body with reſpect to its Heat, and ſome of the Effects of Heat and Cold upon it.*

Though the Connection of ſome looſer Thoughts with theſe Subjects may not appear great, you will at leaſt ſee how I was led into them; if they ſeem neither entertaining nor uſeful, you are at full Liberty to retrench them, or any other Parts, or indeed to ſuppreſs the whole.

In Theories, whence we deduce no Corollaries for the Good of Mankind, we ought to be as ſolid as poſſible; becauſe thoſe things, which to us ſeem only Matters of Speculation, to after Ages may become the Foundations of uſeful Practices. But in a particular manner ought we to be cautious to the laſt Degree of ſetting up a Theory, that is doubtfully founded, in Matters of Practice; eſpecially in ſuch as are of the greateſt Conſequence. 'Tis no better than working on empirically, perhaps much worſe; becauſe one is not ſo apt, from want of Succeſs, to take Correction, and alter a Practice which he holds good, as being eſtabliſhed on the Baſis of what he thinks a ſound Theory.

I ſhall give an Inſtance, becauſe it is to

my Purpoſe at this Time, in one of the moſt prevalent Opinions in our Buſineſs, held by the greateſt Men in our Way; which to me, ſeems weakly, at leaſt doubtfully, founded, and upon which a bad Practice may be built, I mean the Theory of *animal Heat*. An Accident in Practice gave the firſt Riſe to my thinking ſeriouſly on this Subject; it was the Difference of Opinions about the Cure of a Gentleman, who was voiding vaſt Quantities of Blood by the Noſe. One of his Doctors had bled him ſeveral Times, and propoſed to put his Legs into warm Water, to make a Revulſion, and diminiſh the Force of the Solids in general; the Attrition of which, he ſaid, had heated the Blood extremely: All was done to no Purpoſe. The other maintained the Diſeaſe to be owing to an inteſtine Ebullition of the Blood, (which he compared to a boiling Pot that ſubſides on pouring in cold Water) and that this Effervescence would cool, as ſoon as a ſmall Portion of any ſtrong Acid could be mixed with the Blood: He then gave a few Gutts of Oil of Vitriol in Juice of Lattuce, and repeated it once and again after a few Minutes. In leſs than half an Hour the Bleeding ſtopped. I will not determine which, or if either was in the right; thinking it to be ſervice done Mankind, if at any Time we

can

can ſhew that a Theory is at beſt but doubtful; and that therefore it is not ſafe to draw our Practice from it.

The Knowledge of the animal Oeconomy, in a great many Parts of which we are as yet very defective, ſeems as well worth the purſuing as any other, particularly to Men of our Buſineſs. I have choſen to contribute my ſmall Endeavours toward the clearing up of one Part of it (which notwithſtanding the Learned have beſtowed much Labour upon it, remains ſtill in great Obſcurity) by offering a few Thoughts that may conduce ſomething toward the Solution of this Problem.

To what Organs or Operations is the Heat of the human Body owing?

I ſhall not ſtay now to examine the long-ago exploded *calidum innatum*, nor the Diſtinction betwixt *innate* and *influent* Heat, on which Figment moſt of the Medicine in former Ages was unhappily founded; being, perhaps, to meet with them again; but ſhall go on directly to conſider ſome of the Opinions that at preſent prevail.

The *Firſt* is, That the Heat of our Bodies is owing to the mutual Attrition betwixt the Arteries and our Blood.

The *Second*, That the Lungs are the Fountain of this Heat.

The *Third*, That the Attrition of the Parts of the Solids on one another produce it: To which I shall add a

Fourth, which is more neglected, namely, that whole Process by which our Aliment and Juices are constantly undergoing some Alteration.

I. Then, it is generally taught, that this Heat is owing to the Action of the Arteries upon the Blood.

The Favourers of this Opinion pretend both to prove it, and account for it.

1. They endeavour to prove it from many Topicks, such as: That if an Artery is tied or cut, the Part to which it goes turns cold. On the ceasing of the Pulsation of the Arteries, Cold and Death follow. An Increase of Heat attends a brisk Circulation, and a languid Circulation is accompanied with small Heat. One who burns in a Fever, or is hot with Exercise, has a full and frequent Pulse; in cold Faintings, *Chlorosis*, *&c.* the Pulse is small and slow. To these they add, That the Thermometer shows the arterial Blood to be a little hotter than that of the Veins.

2. They account for it; from the conical Fi-

Figure of the Arteries; from their Flexures and Branchings into exquiſitely ſmall Capillaries, whence the Reſiſtance, and conſequent Attrition, muſt be great; from the Number, Strength and Elaſticity of their Coats; from the propelling Power of the Heart, and their ſtrong Reſiſtance. From all theſe they infer, That the Particles of the Blood perpetually getting new Motions, Directions and Rotations; are attenuated, condenſed, have their Angles grinded off, and are made homogeneous; thence, they ſay follow the *Fluidity*, *red Colour*, and *Heat* of the Maſs which is here perfected.

I ſhall not examine this plauſible Theory narrowly, only hint a few things that ſeem to make it more doubtful.

1. Then, as to the Proof, it ſeems lame: For (*a*) what is ſaid of Arteries, may be ſaid of any other Parts, whoſe Functions are neceſſary to Life; the Lungs, Brain, Nerves, &c. becauſe, on the ceaſing of their Functions, Life, and Heat fail. (*b*) But we don't find theſe two, I mean the Heat and Pulſation of the Arteries, keep together in any regular Proportion: In ſome morbid Caſes there is a great ſenſible Heat, and a ſmall Pulſe; and in others a full enough Pulſe, and very great Coldneſs. I ſhall adduce no other Evidence for this than one

Inſtance, from an Author neither ſuſpected of Diſhoneſty, nor of being biaſſed by Theories; I mean *Sydenham*, who, writing on the hyſterick Diſeaſe, ſays, *Quam quidem refrigerationem, haud ſemel, iſti, ferè quâ rigent cadavera, parem comperi, pulſu nihilominus recte ſe habente.* Beſides (*c*) all the length the Demonſtration goes, is to ſhew that the Motion of the Arteries and Heat are generally in Proportion, which however does not ſhew which is the Cauſe, and which the Effect, nor indeed that either is the Cauſe or Effect of the other, ſince both may be the Effects of ſome other Cauſe: For it is as fair to uſe the Argument backward, and ſay, ſince the Arteries beat quicker and fuller when I am heated by Wine, the Fire, or Exerciſe; therefore the Heat is the Cauſe of this increaſed Pulſe. (*d*) As to the Proof by the Thermometer, till it is well vouched, I muſt be forgiven if I doubt of it at leaſt. I lately attempted the Experiment, and endeavoured, after having laid the jugular Vein and Carotid Artery of a Calf bare, tied them, and cut them off at once, to let as equal Quanties of Blood as I could, flow, in equal Times, into equal Cups, in which were pretty well adjuſted Thermometers. The Reſult of the Experiment was ſo far from diſcovering the arterial

Blood

Blood to be warmer than that of the Veins, that in leſs than a Minute, the Thermometer which was in the venal Blood roſe ſeveral Degrees above that which was in the other. The Difference was indeed ſo great, that I imagine there muſt have been ſome Miſtake or Miſmanagement in the Matter; and therefore build nothing on it, till further Trial bring us to a Certainty. (*e*) What will add to my Doubts of the arterial Blood's being hotter, till it is proved, is, that the venal Blood does not coagulate ſo ſoon as the arterial. The other Arguments adduced to prove this Theory, are liable to the like Objections; therefore I may ſafely conclude, that it is not as yet eſtabliſhed by any ſatisfactory and convincing Proof, I ſhall then go on.

2. In the *ſecond* Place, to examine a little the Ways by which they account for their Hypotheſis. And, *firſt*,

(*a*) As to the conical Shape of the Arteries, I have often grudged to ſee the noble Means of extending and applying natural Knowledge, I mean the Mathematicks, abuſed, and brought in to help out a Theory. The very Word, *Conical*, carries a great Weight with it, and now-a-days every Body ſays the Arteries are *conical*: but I can by no means allow them to be Cones, ſo as to

infer the Action of a converging Canal on its Contents. Look at Portions of Arteries injected, and you will be ſatisfied that they are not Cones to the Senſe, as ſome Authors call them. Examine the Figures of the Veſſels from *Italy*, preſented to the Royal Society by Mr. *Evelyne*, look at the Tables of *Euſtachius*, *Veſalius*, *Caſſerius*, &c. and in all of them you will find the Portions of the Artery betwixt the Ramifications to be for the moſt part cylindrical, and to diverge as frequently as converge. No doubt as the Branches draw off the Blood, the Trunk diminiſhing may in a groſs Senſe be called conical, and I ſhall allow them to be ſo, as far as this Figure goes, and that *A* is a much larger Section than *X*. But as the Blood moves ſlower at *X* than at *A*, it is contrary to the well known Laws of Hydraulicks to apply the Effects of hollow Cones on Liquors flowing in them *à baſi ad apicem*, to the Action of the Arteries on the Blood; ſince in the firſt the Liquor muſt neceſſarily flow quicker at the Top

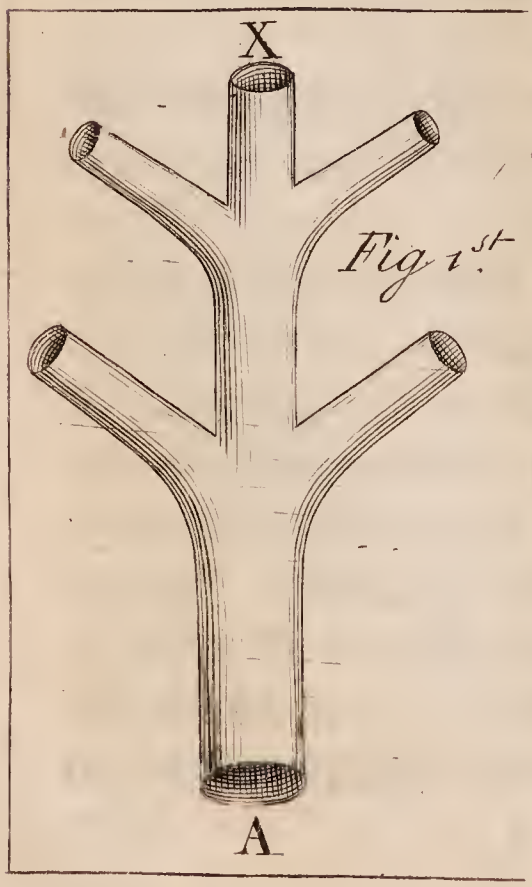


Fig 1ſt

Top of the Cone; and in the Arteries we find the Blood moves ſlower the further it is removed from the *Aorta*, which they conſider as the Baſe of the Cone. The arterial Syſtem may, with more Propriety, be ſaid to reſemble Cylinders, frequently divided and ſubdivided, ſtill terminating in Numbers of ſmaller Cylinders, the Aggregate of which is always of greater Capacity than the Trunk or larger Cylinder before the Ramification. But if they will have the Artery a Cone, let it be inverted, and let the Blood flow from the Top to the Baſe, as it really does: But then down falls all that fine Reaſoning that was founded on the Doctrine of the Cone. 'Tis Pity our great Maſters ſhould be led by mathematical Speculations, and not by their Eyes; aſſuming doubtful Facts, and reaſoning mathematically on them. Thus here, ſome of them take for granted, that the Power forming the Arteries is the Blood driven through them by the Heart; then, according to the known Laws of Hydraulicks, they ought to be conical. But this Doctrine is at leaſt *gratis dictum*. One might perhaps, on the ſame Principle, reaſon about the conical Shape of the Guts, though we know that they were formed before there were Contents to diſtend and give them Shape: May not the

Arte-

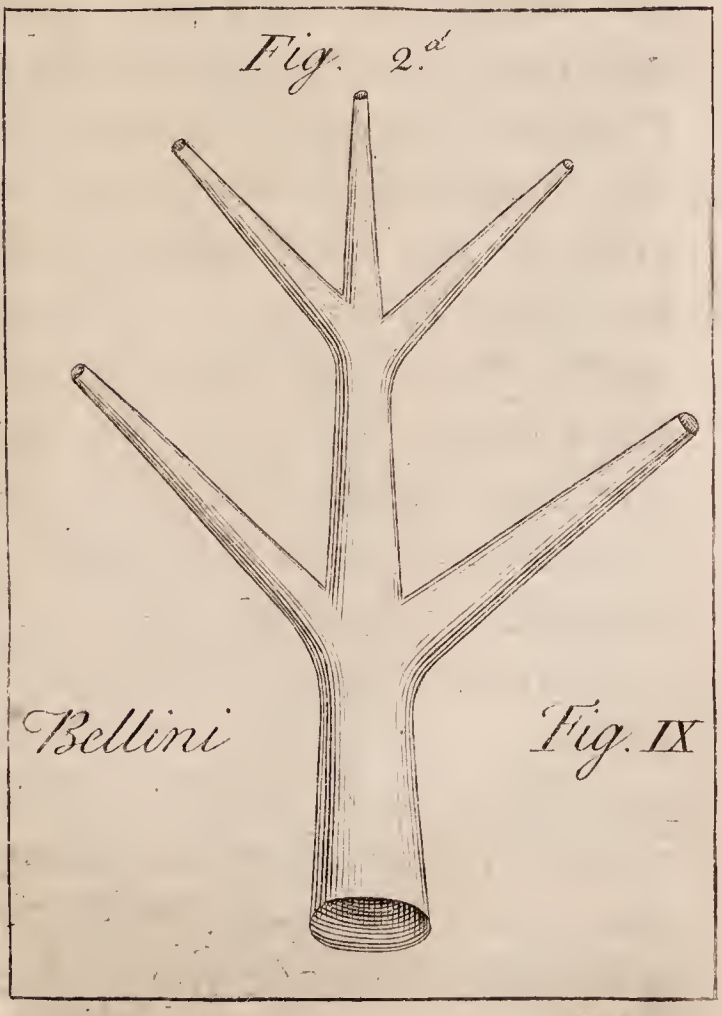
Arteries alſo have owed their original Form, in the ſame Manner, to that plaſtick Power, of which we know very little; and not to the Blood, which they were deſtined and prepared afterwards to tranſmit.

This Doctrine has been of late ſo generally taught, that there is hardly a modern Book, in which there is any thing of medical Theory, that does not mention the conical Form of the Arteries; I hope therefore I ſhall be forgiven if I make a ſhort Digreſſion, and examine how a Doctrine, that ſeems at once to contradict our Senſes, and the common Laws of Hydraulicks, came to be ſo univerſally received.

One able Theoriſt, even without deſigning it, is capable of miſleading the whole Schools; eſpecially if he happens to employ a mathematical Figure and a Demonſtration: For thoſe who come after are ſeldom at Pains to examine the Foundation; whether it be a true Principle, or only a Suppoſition, that may or may not be; whether it is an expreſs Demonſtration of a Doctrine, or only an Illuſtration, where more Latitude may be taken, and where there is no Neceſſity of being tied down to phyſical Truth.

The great *Bellini*, not miſtaking, I hope, but miſunderſtood, has given Riſe to the ſubſequent Opinions about the Form of the Blood-

Blood-veſſels. In his Treatiſe *De motu bilis* ſome unlucky Expreſſions have occaſioned all theſe Miſtakes. In his Prop. 26. he ſays, *Si canales ſint anguſtiſſimi ad orificium minus, quemadmodum ſunt canales minimi cujuſcunque animalis, &c.——ita liquidum fluens per ejuſmodi conicos canales exiliſſimos, nitendo in orificia anguſtiſſima, ſibi ipſi eſt fluendi vis & impedimentum.* In the 28th he hath theſe unhappy Words: *Quoniam enim univerſa arteriarum ſeries conica eſt, & fluxus ſanguinis per ipſas eſt ab ampliori orificio verſus anguſtius.* Theſe, and two or three more ſuch Sentences, with his 9th Figure, (which I here ſubjoin) have made the Writers after him take theſe things for demonſtrated, which are neither true, nor, in my Opinion, meant by him to be thought true.



What

What makes me abſolve *Bellini* is, *firſt*, The Improbability of his believing and teaching a Doctrine attended with one of theſe two; either the Abſurdity of a Liquor's flowing in a full conical Canal, *à baſi ad apicem*, and yet moving ſlower at the Top than at the Baſe; or with this Aſſertion, That the Blood flows quicker in the ſmall Veſſels than in the *Aorta;* the Falſhood of which every Boy, who has once ſeen the Circulation through a Microſcope, knows. But, in the *ſecond* Place, I think *Bellini*, if he is attended to, clears himſelf: Even in his Prop. 27. where he uſes that unlucky Figure, he not only has the Words *quaſi conicus*, as a Caution againſt Miſtakes; but the Tenor of the Demonſtration ſhews, he means *conical* only in the lax Senſe, in which a Tree may be called conical, the Trunk ſtill decreaſing as the Branches derive from it; and he uſes the Compariſon of a Fir-tree, which, from the Top to the Ground, excluding all Conſideration of the Branches, may be called a Conoide. Further, in his *Prop.* 28. he demonſtrates, that though the Arteries are cylindrical, or of any other Shape, the Blood will ſtrike againſt their Sides, as if they were conical; and that therefore the Demonſtration, on the Suppoſition of their being Cones, will hold, though they are really of any other

ther Shape: And (though he ſpeaks doubtfully of their Form) he ſeems to mean no more, than that he uſed the Cone for Facility of Demonſtration, Matters being much the ſame in a Syſtem of infinitely divaricated Canals, as to the *Occurſus* and *Impedimenta*, which were the main Things he had to ſet forth. Moſt of *Bellini*'s Followers, not obſerving fully his Purpoſe, have taken him too literally, and what he intended only by way of Illuſtration of the *Obſtacles* and *Reſiſtances* the Blood had to overcome in its Way from the Heart to the Veins, they uſe as a ſtrict Demonſtration.

The celebrated *Boerhaave*, treating of the Fabrick of the Blood-veſſels, trode *Bellini*'s Footſteps, both in embroiling the Subject, and in part clearing it up again. He ſays in his *Inſtit.* § 132. *Arteriæ quidem cernuntur eſſe canales ad ſenſum conoïdei.* And § 142. *Ergo vitalis cruor fluit quidem per arterias, ſed fluxu eunte à corde ad extrema, ex latiori in anguſtiorem partem.* And § 215. *Cruori pulſo in arteriam reſiſtit ſanguis arterioſa vaſa replens, conica arteriæ figura.* And § 217. *Quia ergo omnis omnino ſanguis tanta vi agitur, & ingenti adeò obſtaculo repellitur, in canali pleno, conico,* &c.

Theſe and ſuch like Expreſſions are apt to

to miſlead thoſe who have any Notion of the *Conic Sections*, and hear the Form and Properties of hollow Cones applied to the Arteries. Yet, after all this Pomp of mathematical Science, ſo capable of amuſing Scholars, the plain Truth muſt come out: And, in my Opinion, he ſolves all by ſaying, § 222. *Quia verò arteriæ ſenſim augentur numero, & capacitate——erit itaque cæteris paribus, velociſſimus circa cor, tardiſſimus remotè à corde, motus humorum circumeuntium.* This is all I want, for when this is granted, it at once deſtroys all the Arguments which their Followers have built upon the Cone. I have inſiſted perhaps too long on this Head, but the Streſs of the Argument being commonly laid here, I could not avoid it.

(β) As to the Number, Strength, and Elaſticity of the Coats of the Arteries, which are ſaid to cauſe this Heat; they ſeem to me unfit to produce it, and indeed to be no more than enough to carry the Blood along to the numberleſs Places where it is to miniſter to the ſeveral Functions of the different Parts: The Blood in them moves every Moment ſlower, which perhaps may be in order to the Particles, their getting Leiſure (ſo to ſpeak) to riſe, ſubſide, attract, &c. ſo as to form all the different Secretions. This ſeems the more

more probable, that we ſee Mechaniſms of wonderful Contrivance provided for making the Motion of the Blood in the Arteries ſlow, yea almoſt ſtagnant in order to ſome Secretions. The greateſt Conquaſſation of a homogeneous Liquor, ſuch as Water or Oil, has never been obſerved to raiſe any Heat; and we have little Reaſon to expect it from the bare propelling Force of the Heart thro' the Arteries, and the Preſſure of their Sides on the contained Fluid.

(γ) The Heat from Attrition is chiefly laid on the infinite Ramification of the ſmall Arteries, where almoſt every Globule of Blood rubs the Sides of the Capillaries: Even here it is very unlikely that the Blood ſhould acquire Heat, if we conſider, *firſt*, that the Motion is ſlow. I have obſerved frequently a Globule of Blood take ten or twelve Pulſes to carry it paſt my Microſcope. Moreover, the Elaſticity of the Particles, the Softneſs and Lubricity of the Parts of the Blood, and of the Canals; make it very improbable that Heat is generated here by Attrition: And if the Motion, and conſequently the Heat, decreaſes *in minimis*, where the *attritus ad latera* is greateſt, the Matter is not mended in the great Arteries; where, though the Velocity of the Blood makes the *attritus ad latera* greater, the

Por-

Portion of the Blood that touches the Canal is too ſmall to warm the whole Section. The great ſeeming Difficulties and Reſiſtances the Blood has to overcome in the ſmall Veſſels, which have given Riſe to this Opinion, would have diſappeared, if *Bellini* and his Followers could have been ſatisfied with *Borelli*'s Illuſtration, of the Circulation *in minimis*, by a Filter or wet Spunge; through which Water flows, without any greater Force than the Weight of Liquor in the depending Part: And that this is the true Theory will be readily enough believed by thoſe who are of Opinion, that the Circulation begins and ends with the Veins.

I ſhall conclude what I have to ſay about their accounting for this Syſtem, with *Boerhaave*, § 220. where, enumerating the Effects of the Action of the Arteries upon the Blood, he has theſe Words: *Ex his ſequitur totius maſſæ fluor, calor, color.* There are ſtrong Preſumptions, of which we have above alledged one, againſt the greater Fluidity of the Blood in the Arteries: That it gets its Colour here is certainly not true, the Blood firſt appearing florid in the pulmonary Veins: And as it has its Colour before it arrives at the left Ventricle, for any thing I have yet ſeen to the contrary, it has its Heat before it comes to the right; at leaſt

leaſt the Blood's acquiring Heat in the Arteries, more than elſewhere, has not hitherto been evinced, either by ſatisfying Argument or Experiment. Indeed, ſo little convincing has been ſaid on this Head, that one would be almoſt tempted to imagine, that this Opinion owed its Origin to the Difficulty of ſeparating the two Ideas of *red* and *hot*, which go ſo oft together.

However frequently we may obſerve various Effects from one Cauſe, yet, ſince we ſee ſo many other important Purpoſes of the animal Oeconomy obtained by the Motion of the Blood in the Arteries; ſuch as Nutrition, Secretions, Excretions, and moſt of the conſiderable animal Functions; it ſeems to be quite unneceſſary to aſcribe alſo the *warming*, *fabricating* and *perfecting* the Blood to them alone; unleſs we can find no other *officina* for theſe: Eſpecially if we conſider, that the Blood could hardly receive any Benefit of that kind, in ſome of the Arteries of greateſt Importance, in which it has very ſhort Time and Way to run, as in the *Coronaries*: And if not neceſſary in them, why in others? How much more natural is it, if we can find another Fountain of Heat more plauſible, to reſt ſatisfied that the Arteries have Offices enough, in carrying along the Blood; diſmiſſing what is

useless and noxious; separating and applying what is fit for every Part; and returning the Remainder to the Veins, to be repaired and rendred fit for a new Circulation.

The Construction of the Arteries, so as to admit no Mixtures of any kind, or no immittent Vessel of any other kind, seems to be an additional Presumption against their being the *Officina* where the Blood is perfected; for, except its Motion, which is every Moment growing slower, and such Attrition as they can give it in that Motion forward, it can have nothing to promote its Perfection; whereas, in the Veins it meets with new Matter every now and then, from all the different Parts of the Body, and particularly with new Chyle; and in the Lungs with what we shall not at present give a Name to.

If it be objected, since the Blood acquires no Heat from the Vessels, why does the Heat cease when their Motion stops? I shall at present admit the Fact (though I don't think it true, for Reasons to be given at another Time) and grant, that the Circulation promotes the Heat, in so far as it moves the heterogeneous Mass, and makes its intestine Motion much greater than it would be in a stagnant State: But from this to infer, that the Action of the Solids on the Fluids

Fluids is the Cauſe of animal Heat, would be as unlike a Philoſopher, as it ſhould be for one, who, ſhaking a Bottle containing an efferveſcent Mixture, would entirely paſs by the inteſtine Motion, which is much augmented by the ſhaking, and attribute the whole Heat to the Action of the inner Surface of the Glaſs on the contained Fluids. Having advanced ſome Reaſons for doubting that the Blood owes its Heat to the Arteries, I go on to the ſecond Opinion.

II. Which is, *That the Lungs are the Fountain of Heat in the human Body.*

As I am neither able nor willing to write a Volume, on the abſtruſe and wide Subject of Reſpiration; I ſhall only hint at a ſmall Part of what is moſt to the preſent Purpoſe.

In the Theory that now prevails, all that was ſaid for the Blood's being heated in the Arteries, is repeated in the Lungs, with conſiderable Addition; *viz.* That in the Lungs the Blood veſſels every where attend, divide and ſubdivide along with, the Ramifications of the Wind-pipe; and, as theſe are perpetually changing their Situation and Form, becoming longer or ſhorter, making more acute or more obtuſe Angles; ſo muſt the concomitant Blood-veſſels every Moment make

new Angles, and give the Blood new Directions; that at laſt the Blood enters into an exquiſitely fine Net-work, ſpread every where on the vaſtly thin Air Veſicles, where theſe little Air-bladders are perpetually changing their Angles, Points of Contact, their Form, Volume, Interſtices, and ſo forth: From theſe, and the Elaſticity of the Air, and the Weight of the Atmoſphere, the Blood is ſaid to be churned, preſſed backward and forward, broken and kneaded together, diſſolved and condenſed, made *red* and *hot* in reſpiration. This makes a plauſible Theory, but does not ſatisfy me; for theſe Reaſons,

1. What was ſaid before, of the Improbability of Heat's being generated by the ſole Attrition of Solids on Fluids, is as ſtrong here, as it was in the Argument concerning its being produced by the Action of the Arteries in general.

2. Though the Lungs be regularly ſupplied with Plenty of Air, that has Weight and Elaſticity enough to carry on the alternate ſwelling and ſubſiding of the Veſicles, which ſhould anſwer all the Purpoſes of this Theory; yet Life and Heat ſoon fail, if that Air has, by paſſing through the Fire, or any other Way, been rob'd of ſome Particles

ticles or Quality, different from its Weight and Elaſticity.

3*tio*, The Argument from the additional Action of the Solids of the Lungs on the Blood, more than what is found in the Arteries, from their greater and conſtantly varying Motion, ſeems to be fully taken off by one Part of *Hook*'s Experiment, exhibited before the Royal Society. Dr. *Hook* having fixed the Noſe of a double Pair of Bellows in the Wind-pipe of a Dog, and cut away the Ribs, Diaphragm and *Pericardium*, and pricked all the outter Coat of the Lungs, that Plenty of Air might get out; he then made a conſtant Blaſt, by which Means the Lungs were always kept very full, and without any Motion. The Dog lived, and his Heart beat regularly. This ſerves to ſhew that the Animal can live, and the Circulation go on well, when the Veſicles are conſtantly and equally diſtended; and conſequently, that there is no Need for that frequent and great Variation of Angles and Points of Contact, upon which the modern Theoriſts build their additional Attrition. This being all I wanted from the Experiment, I might paſs the reſt of it; but as it lies in my Way, I ſhall add the Remainder, with his Reaſoning upon it, though I am not ſo well ſatisfied with

them. On ceaſing the Blaſt, and ſuffering the Lungs to ſubſide, the Dog fell into dying convulſive Fits, but recovered on renewing the Fulneſs of the Lungs, with the conſtant Blaſt of freſh Air. At laſt, cutting off a Piece of the Lungs, he ſhewed the Blood paſs eaſily through them, both when expanded conſtantly, and when they were ſuffered to ſubſide and ly ſtill. From theſe he argues, *That as the bare Motion of the Lungs, without freſh Air, contributes nothing to the Life of the Animal, he being found to ſurvive, as well when they were not moved as when they were; ſo it was not the ſubſiding or Moveleſsneſs of the Lungs that was the immediate Cauſe of his Death, or the ſtopping of the Circulation of the Blood through the Lungs, but the want of a ſufficient Supply of freſh Air.*

I doubt of a Part of the Experiment, and am far from being perſwaded that his Argument is concluſive the Length that he urges it; becauſe there may be other Purpoſes gained by the perpetual Play of the Lungs, beſide the Attrition, or importing into, or exporting from them, any ſalutary or noxious Particles, or Qualities. I ſhall name two of them, which have been much inſiſted on, *viz.* the free Circulation of the Blood through the Lungs, and the preſſing

the

the Blood into the left Ventricle of the Heart.

As to the *firſt*, I doubt of the Blood's circulating as freely through the Lungs in their collapſed State, as when they are inflated: That it does not, may I think be inferred, from there being a *foramen ovale*, and *canalis arterioſus* in the *Fœtus*, provided to carry a conſiderable Part of the Blood toward the Arteries, without paſſing through the Lungs, which 'tis preſumed would not have been, if the Lungs had tranſmitted it freely in their collapſed State. Nor do I think the Blood's flowing when Dr. *Hook* cut off a Piece of the Lungs, any Demonſtration that it circulated freely through them when collapſed; becauſe, if any Branches of the pulmonary Artery are cut, they will not only yield Blood, though the ſmall Veſſels are obſtructed, but pour it out the more freely, that the Capillaries, which naturally ſhould receive it, are not able to tranſmit it.

As to the Blood's being preſs'd into the left Ventricle by the Play of the Lungs, this not only bears a great Shew of Probability, but is alledged by ſome to be the main, if not the only Uſe of the Lungs; without the Aſſiſtance of which, it is ſaid, the left Auricle and Ventricle could never have been

filled. I am apt to believe that there is ſomething in this, from the Senſe of Suffocation felt immediately, or very ſoon, after the Lungs are at reſt: And I can eaſily grant, that as Nature, from one Cauſe, produces frequently, beſide the main Effect, alſo other ſubſidiary Advantages; ſo here, the Blood may be aſſiſted in overcoming the Reſiſtance of the ſtronger left Ventricle: But, as it is not to be imagined that ſo large and complex a Machine as the Lungs, ſhould be contrived for no other Uſe, but to puſh the Blood into the left Ventricle (for which Purpoſe the *Sinus venoſus* and left Auricle are provided with muſcular Coats) we have reaſon to ſuſpect that there are other great Purpoſes anſwered, which could not be ſo well attained without this grand *Apparatus*. But as theſe have nothing to do with heating or cooling the Blood, I only touch them by the by, and return.

Though I am unwilling to enter upon any Arguments againſt the Blood's being heated in the Lungs, from other Cauſes than the Attrition, with which chiefly I have to do; yet I cannot avoid adding ſome Reflections, which make me imagine that the Blood does not acquire Heat in the Lungs at all. Indeed I am induced to think in this Way, whether I conſider the Office of the Lungs *à priori*,

or

or *à poſteriori*; whether I conſider the *Cauſe*, or the *Effect*. For,

4to, It ſeems a very unfeaſible Opinion, that in the ſpongy Lungs, on the numberleſs Air-bladders of which, the Blood is ſpread almoſt ſuperficially thin; the Effect of the cold Air's ruſhing into theſe Veſicles, and touching, or almoſt touching this thin Surface of Blood: That this Effect, I ſay, ſhould be to make the Blood hot: This appears to me to be an Aſſertion ſo odd, that no bare Hypotheſis, or favourable Conjecture, can make it go down, without ſome ſtrong Proof; and hitherto none has been produced. And as the Cauſe appears not at all promiſing *à priori*, ſo the Effect ſeems to demonſtrate this not to be the Cauſe. For,

5to, That the Blood is *de facto* rather *cooled* than *heated*, in the Lungs; may be inferred from the Comfort and Benefit received by the Inſpiration of cool Air, in many inflammatory Diſeaſes; eſpecially thoſe of the Lungs. In burning Fevers, with a full quick Pulſe, red Skin, and a large and quick Reſpiration, I have oftner than once given preſent Relief, by opening a Window, and admitting a Stream of cool Air to breathe in: The Effects of which I have carefully obſerved to be, that (though the Body continued cloſe covered) in one Minute the Reſpiration

ſpiration became ſlower; and very ſoon after, the Pulſe has abated of its Fulneſs; and not only the Face, but the whole Body, of its fiery Heat and Colour.

6to, If the Blood were heated in the Lungs, one would be apt to think, that we ſhould need leſs of their Function when we are warm, or in a warm Place; the Heat of our Bodies, or of the Atmoſphere, doing ſo much of the Office of the Lungs; and that we ſhould want more of it when cold, or in cool Air. But it will occur to every body, that when we are hot and want to be cooled, we breathe full and quick; and when we are cold and want to be warmed, our Reſpiration is ſlow and ſmall; contrary to what one would expect, if the Action of the Air on the Blood in the Lungs were to heat it.

7mo, If I were fond of ſtraining for Arguments on this Head, I might adopt *Helvetius* his Syſtem; but I ſhall not enter far into the Diſpute betwixt him on the one Side, and *Santorini* and Dr. *Nichols* on the other, about the Capacities of the Ventricles of the Heart, and of the Veſſels leading to and from them: For, conſidering how difficult a thing it is to take the preciſe Dimenſions of theſe Parts, and how apt the beſt Men are to find things according to their Wiſhes; we cannot depend on the precarious

ous Meaſures of thoſe who are labouring to eſtabliſh, or overturn, a Theory. I am indeed inclin'd to believe that there is more in *Helvetius* his Opinion, than his Opponents will allow; and that the Meaſures will not commonly come out as *Santorini* found them; by what *Harvey* ſays in his Proem. *Vena arterioſa vas amplum cum tunica arteriæ factum; arteria venalis vix pari magnitudine cum tunica molli laxa.* But all the Uſe I ſhall make of their Diſpute is, to infer, that ſince even thoſe who write againſt *Helvetius*, bring no Experiments to ſhew that the Blood comes from the ſmall Veſſels of the Lungs more expanded than before; we have no Reaſon to believe that it is rarified by that Function. And, though they ſhould prove againſt him, that the Blood is not more condenſed, yet if they cannot likewiſe prove that it is more rarified, I ſhall doubt of its acquiring Heat here: For moſt Liquors rarify by Heat, and few more than Blood, as I hope to make evident when I come to treat of the *warm Pediluvium.*

8*vo*, I ſhall conclude my Reaſons for imagining that the Blood does not owe its Heat to the Action of the Lungs, with this; That I ſuſpect we muſt look out for another Source of Heat in the Egg and Fœtus: And Cauſes are not to be multiplied without evident Neceſſity.

ceſſity. To the Objection, That the Heat of the Mother is ſufficient for the purpoſe till this new Function comes into Action; I oppoſe two Obſervations. The firſt is, that toward the End of Incubation, I am told, an Egg may be left by the Dam, in a cold Seaſon, for a little longer Time than would be ſafe for the Chick, if all its Heat depended on her; yea long enough for an Egg that contains no warm Principle, to become of the Temperature of the ambient Air; yet, on opening it, the Chick has been found neither quite ſo cold, nor dead. The ſecond is, that a ripe Fœtus, taken away from the Mother, but continuing within the Membranes, can live ſeveral Hours by its own Heat, without any Aſſiſtance from the Lungs. Therefore I ſhall continue to ſuſpect this Theory, till the Patrons of it ſhew the Cauſe of Heat, before the Lungs acted; and alſo account for the failing of that Source, upon the Lungs coming in to play. Having ſaid enough on this, I go on to the

IIId Opinion, which ſhall be diſpatch'd in a few Words. It is of ſome who being ſuſpicious that the Action of the Veſſels on the contained Fluids could not generate Heat, yet being wedded to the Notion that the Cauſe of Heat is to be ſought in the Solids, make

make it owing to the Action of their Parts on one another. The Heart and Arteries move moſt, and it ſeems natural to expect that the Heat ſhould be owing to this Motion. But even this does not ſeem very plauſible, from theſe few Conſiderations, among many others.

1*mo*, The moving Parts, however we term them *ſolid*, are neither hard nor dry; which two Conditions ſeem abſolutely requiſite to make them fit to generate Heat, in the coarſe mechanick way of Attrition.

2*do*, None of their Motions are ſwift enough to promiſe Heat in this Way.

3*tio*, Their Motions are very ſmall; or, in other Words, they have no great Change of Surface in their Attritions.

4*to*, The moveable Fibres, as far as we can trace them by the beſt Microſcopes, have, to the laſt *Stamina*, Fat, Mucilage, or Liquors every where ſurrounding them, provided by Nature, to prevent their being deſtroyed, or heated, by Attrition. I come now to the

IVth Opinion about the Cauſe of the Heat of our Bodies, which is, *That Proceſs by which our Aliment, and Fluids, are perpetually undergoing ſome Alteration.*

Before I begin to explain what I underſtand by this Proceſs, I beg leave to premiſe

a few Things, most of which are granted by every body.

1*mo*, The intestine Action of the minute Parts of mixed Bodies on one another, is capable of producing as great, or greater Heat, than can be produced by the mutual Attrition of the Surfaces of the hardest Bodies. From Gun-powder will arise as great and sudden Heat, as from Flint and Steel.

2*do*, The Parts of mixt Fluids acting on one another, are capable of raising great Degrees of Heat; as well as those of Solids upon Solids. Every body, a little vers'd in Chymistry, knows that there are cold Liquors, which, when mixed, produce instantly a fierce Flame.

3*tio*, No Attrition or Action of any solid Body, on any homogeneous Fluid, has been shown to create Heat. Water, Oil and the like have been conquassated long, with the greatest Violence, without being in the least warmed. Nor does the Experiment adduced by *Albinus* and my Friend Dr. *Martin*, of Cream's becoming warmer by being churned, infer any thing to invalidate this: The Heat there, seeming rather owing to a chymical, than a mechanical Cause; and to be an Effervescence happening on the Alteration, by which the component Parts of the Milk, which is a pretty heterogeneous Substance,

are

are changed and ſeparated, in making Butter.

4*to*, No conſiderable Alteration of mixed Fluids has been obſerved to be made, by the ſole Action of Solids on them, independent of the Action of their minute Parts on one another. No churning of a vegetable Juice attenuates its Oil into Alcohol; no Conquaſſation of a Lixivium changes the Salt of it from a fixed to a volatile Nature; as far as we know at leaſt.

5*to*, It is agreeable to the Laws of natural Philoſophy, to reaſon on the Chymiſtry of the animal Body, as well as on the Mechanicks of it. The beſt Philoſophers have perhaps always been the beſt Mathematicians, but tolerable Mathematicians have not always taken in the wide Circle of Philoſophy. In Bodies, the Conſideration of the Action of one upon another, while they can be meaſured by their Sides and Angles, is called *mechanical*, and has been well treated of by mechanical Writers: But when Bodies come to be ſo minute, that we cannot apply the ſame Laws, we give other Names to the Knowledge relating to them; ſuch as *hydroſtatical*, *chymical*, &c. Here, no doubt all is tranſacted by Laws, as firmly eſtabliſhed as in the other: But the thorough Philoſopher reaſons on Fluids, and the

minute

minute component Parts of Solids, by a Set of Laws peculiar to them; and will not apply the coarſer mechanical Laws to their intimate Changes, and their Actions on one another.

6to, Moſt of the chymical Proceſſes, where the Texture of the Subject is much changed, are attended with Heat.

Theſe being premiſed, I go on to conſider this Proceſs. In order to diſcover ſomething of the Nature of which, let us look about for ſomething analogous, and ſee if we can find any Proceſſes that come near to ours. The two moſt conſiderable and moſt common ones, by which the ſame Subjects undergo great Alteration, are *Fermentation* and *Putrefaction*.

Let us conſider ſome of the known Appearances of theſe two Proceſſes, and ſee if they can caſt any Light on the *animal Proceſs*, which we are inveſtigating.

Firſt, *in Fermentation*, a few of the Phænomena are, That (1.) There is a conſiderable inteſtine Motion, or Attrition of the Parts of the Fluid. (2.) This Motion is not owing to any mechanick Action, or Influence of the containing Veſſel. (3.) Air is ſome how neceſſarily concerned in the Proceſs; whether in being ſeparated from the fermenting Maſs, or in mixing with it: Poſ-

ſibly

ſibly indeed both; for it is conſtantly emitting Air, and the Proceſs is ſoon quenched either *in vacuo Boyleano*, or when ſhut in with a ſmall Portion of Air. (4.) It is ſtill accompanied with a ſmall, but ſenſible Degree of Heat. (5.) The Liquor becomes thinner, and groſs Lees are precipitated. Theſe are ſome of the moſt obvious Appearances during the Proceſs of Fermentation.

Secondly, after it is compleated, the moſt remarkable Changes of the Subject are, That (1.) the Oil, or a conſiderable part of it, is found ſo attenuated, and volatiliz'd, as to riſe firſt in Diſtillation, and though ſeparated from the Phlegm, to continue ſuſceptible of a Mixture with Water. (2.) Still the Salts that remain continue fixed, and reſt with the Aſhes in Calcination, as before the Proceſs. (3.) The Subject ſtill retains its vegetable aceſcent Nature, and can be changed to Vinegar, or an acid Subſtance.

In *Putrefaction* again (1.) There is likewiſe a great inteſtine Motion. (2.) When carried to a Height, and when the putrifying Subſtance is much compreſſed, it is accompanied with a very great Heat and Smoke, and ſometimes Flame. (3.) Air is alſo neceſſary to it. (4.) The viſible Texture of the putrifying Maſs is changed.

After the Proceſs, the moſt notable Changes of the Subject are, That (1.) in Diſtillation, ſoon after a little Phlegm, with only a ſmall Fire, there ariſes a volatile alcaline Spirit and Salt; and (2.) on Calcination, there remains no fixed Salt with the Aſhes.

In the *animal Proceſs* we are conſidering, (1.) The Subject of it is moſtly the ſame with that of the other two, being at leaſt originally of vegetable Subſtances. (2.) Air is ſome way neceſſarily concern'd in the Proceſs; whether it be in mixing with the Blood, or ſeparating from it, or both; I ſhall not determine here: Thus far is plain, that our Food has Air mixed with it, our Fluids yield Air in the Pump, and we cannot ſubſiſt, either in the exhauſted Receiver, or ſhut in with a ſmall Portion of Air, ſo as to have no Communication with the Atmoſphere. (3.) It is generally accompanied in our Bodies with a Degree of Heat, greater than in Fermentation, and leſs than the higheſt putrifying Heat. (4.) By it the Contexture of the conſtituent Parts is minutely changed. Thus,

(1.) Our Juices, which have fully undergone this Proceſs, are ſo far out of the vegetable Claſs, that they will not turn acid, but rancid. (2.) The Salts, which by Fermentation

mentation could not be raiſed out of the vegetable fix'd State, here loſe their fixed Nature; for no lixivial Salt remains with the Aſhes in Calcination: But they are not exalted to ſuch a Degree as in the higheſt Putrefaction; where, in Diſtillation, after a little Phlegm, there ariſes early, and with a ſmall Degree of Fire, a volatile Spirit and Salt: Whereas our Blood in Diſtillation yields only Phlegm with a ſmall Fire, and no volatile Spirit or Salt for a conſiderable Time, and not without great Force of Fire.

This Proceſs may be one *ſui generis*, perhaps ſomewhat of a middle Nature betwixt Fermentation and Putrefaction; ſeeming by the Product to come ſo near to the latter, that I incline rather to call it by that Name: For there is ſuch a Proceſs, we have the ſame Materials, we have a fit Place for it, a conſiderable Degree of Preſſure by the contracting Force of our Veſſels, the Air not quite excluded, nor included; we have the Subject changed from what it was, a ſenſible concomitant Heat, and the Product very near the ſame. I don't ſee more requiſite to eſtabliſh this animal Proceſs to be of the ſame Nature, and indeed to be a certain Degree of the *Proceſs of Putrefaction.*

Our beſt Philoſophers agree, Putrefaction to be the moſt ſubtile of all Diſſolvents, ef-

fectually disjoining and ſeparating all the component Parts of putrifying Bodies, except Sea-Salt. Now I imagine in this powerful Solution of Bodies, that the inteſtine Action of their minute Particles creates, collects, or ſome way or other, is the Cauſe or Means of *Heat:* For I do not pretend to eſtabliſh the preciſe Nature of *Fire*, or the Manner of its Propagation; about which ſo many Philoſophers have lately exerciſed their Talents, without being able to ſatisfy the Royal Academy of *Paris*, that ſet them to work.

All our Fluids are much diſpoſed to Putrefaction; Blood, Urine, Lymph, *&c.* out of the Body, after ſome time, become highly putrid, even in pretty cool Air, and without any Stirring or Agitation; and our Blood, and ſome of our Juices, out of the Circulation, but within the Body, change to putrid Matter.

This Pus ſhows no high Degree of Putrefaction ſoon, yet if a very ſmall Portion of it is abſorbed into the Blood Veſſels, it raiſes a putrid Fever, as certainly as Yeſt does a Fermentation upon Wort. I imagine this is not owing to its ſtimulating the Solids to quicker and greater Vibrations, but to its increaſing the inteſtine Motion, and accelerating the Proceſs I favour; haſtening the Change

Change of the Animal Juices, to that ſubtile acrid State, that renders them unfit to be retained long in the Body, and diſpoſes them to run off by the Skin, Kidneys or Guts; and, in Fact, we ſee colliquative Evacuations, ſuch as Sweating and Purging, conſtantly attend theſe putrid or hectic Fevers that are owing to internal Ulcers.

Now if the Warmth of our Bodies can operate ſuch a Change on a Portion of our Juices that is extravaſated; how reaſonable is it to conclude, that the ſame Heat makes a greater, and quicker Change, on what is contained within the Veſſels; ſince it is conſtantly moving on, and every now and then meeting with new Mixtures of heterogeneous Bodies, fit to excite new inteſtine Motions? It is true, that our circulating Juices do not ſeem to contract the ſame Acrimony, that the *Pus* we have juſt now ſpoke of does. The Reaſon of this is obvious, when we conſider our conſtant Evacuation of acrid perſpirable Matter, Sweat, Urine, *&c.* and that, as faſt almoſt as theſe noxious Particles are formed; in the Courſe of Circulation, they meet with various Outlets, by which they are diſcharged before they can hurt us: In their Way to the Skin, and other Strainers, they ſerve to maintain a moderate Degree of Heat (probably the true

callidum innatum) enough to keep us warm; but not to create a Conflagration to deſtroy us. Upon the ſtopping of theſe Evacuations, we have dangerous Fevers raiſed.

I have been asked three Queſtions, *viz. Where this Proceſs is tranſacted? when it commences?* and, *when it ends?* To none of which I pretend to give ſatisfying Anſwers; but ſhall wind up this Eſſay by amuſing myſelf with the moſt probable Conjectures, that occur to me, in anſwer to them.

As to the *firſt*, Where *is this Proceſs carried on*? I ſhall make no Ceremony of confeſſing, that I have no fixed Sentiment as to the Place where it is principally tranſacted; having no *Williſian* Notion of any Fervent or excandeſcent Part, the Reſidence of Heat, where the Blood is warmed, kindled and vivified. What at preſent ſeems to me moſt probable is, That it is proceeding conſtantly in all our Juices, eſpecially where there is Blood; and as there is three or four times more Blood in the Veins than in the Arteries, that this Proceſs is chiefly carried on in the Veins; and as the Specifick Coldneſs of the Air in the Lungs, ſeems apter to check than to forward it, it ſeems probable that there is leaſt of it in the Lungs. Perhaps it proceeds faſteſt in the great Veins, and particularly in that great Ciſtern or Reſervoir before

before the right Auricle of the Heart, (the Limits of which may be determined by the Valves of the Jugulars, Azygos, Subclavians, and Iliacks) which may be conſidered as a Working-fat, where all the Ingredients of refluous Blood, Lymph, Chyle, *&c.* mix and work together. The incomparable *Harvey*'s Obſervation of what paſſes in dying Animals, and ſome other Paſſages in his Works, ſeem to favour this Conjecture, *Exercit. p.* 46. *Poſtquam cor & auriculæ à pulſatione quieſcebant, obſcurum motum & inundationem & palpitationem quandam manifeſtam ſuperfuiſſe.* And *p.* 264. *Sanguis in venis contentus (ſuo quaſi fundo) ubi copioſiſſimus (in vena ſcilicet cava) juxta cordis baſim & auriculam dextram, ſenſim ab interno ſuo calore incaleſcens & attenuatus, turget & attollitur (fermentantium in modum) unde auricula dilatata ſua facultate pulſifica ſe contrahens, propellit eum confeſtim in dextrum cordis ventriculum.* And *p.* 275. *Diſtentionis primam cauſam, calorem innatum eſſe, primamque diſtentionem eſſe in ſanguine ipſo (fermentantium in modum) ſenſim attenuato, & turgente, in eoque ultimo extinctum puto.* And in his admirable Treatiſe *de gen. animal. p.* 150, 151. *Fit diaſtole in ſanguine ab interno quaſi*

ſpiritu intumeſcente. Quod enim in lacte ab igne calefacto, & cereviſiæ fermentatione cernimus, idem in pulſu cordis uſu venit; in quo ſanguis, quaſi fermentatione aliqua turgeſcens diſtenditur, & ſubſidit: quod ab interno calore ſive ſpiritu innato efficitur. I omit many Paſſages which I think amount to a Demonſtration that the Blood is both the *Fountain of Heat*, and the *firſt Spring of Motion*: And hope I ſhall be excuſed for bringing theſe long Citations, conſidering they not only give an Air of Probability to what we were conjecturing; but ſeem to aſſiſt us in forming an Idea of the animal Proceſs itſelf. Teſtimonies of this Kind, from an Author who inveſtigated Nature with more Abilities, Induſtry and Succeſs, than all his Followers, muſt be allowed to have a great deal of Weight, eſpecially when we reflect, that he has it not for his Point of view to eſtabliſh any Opinion in the Matter we are treating of, but only deſcribing accurately what he obſerved. Before I go further, I cannot but regrete that the immortal *Harvey* is ſo ſuperficially read, there being ſcattered through all his Works more valuable Materials perhaps, both for the Uſe of the Philoſopher and Phyſician, than are to be met with any where

where elſe, and nothing in them that has any Tendency to miſlead us.

I ſhall conclude this Article, where perhaps I ſhould have begun it, by mentioning the *firſt Concoction*. I might have conſidered what paſſes in the alimentary Tube; in which, not only the finer Particles of our Aliment, but the coarſer Parts which come off in Excrement, are greatly changed and animaliſed, ſo to ſpeak, as appears from what remains after Calcination. I might have ſhewn that this Change happens to our *Ingeſta*, by being only a few Hours in warm Infuſion with ſome of our Juices, where the Alteration cannot be imputed to any ſwift Motion, or mechanical grinding by the *Viſcera*, our celebrated Countryman's Theory of the mechanical Power of the Stomach having been long ago laid aſide. I might have run out on the Heat that muſt ariſe from theſe Subſtances, in ſuch a Degree of Putrefaction; and conſidered the Contents of the Stomach and Guts, as conſtantly communicating ſome Warmth to the whole Body; but ſhall content myſelf with juſt having named them, and only add, That as Philoſophers have compared Animals to Vegetables, whoſe Roots were within their Bodies; I conſider them, as having alſo their Hot-beds, needing conſtant Supplies of putrifying

trifying Subſtances incloſed within them: And, though it is a humbling Reflection, I believe it will be thought a true one, by thoſe who take a full View of the Animal Syſtem; of our Food, the Changes it undergoes; of our Secretions, and particularly the conſtant Steam of Perſpiration reeking from our Skin and Lungs, That *Man's Body, of which he is ſo vain, is little better than a ſmoaking Dunghill.*

I ſhould next proceed to the ſecond Queſtion, which was, *When does this Proceſs begin?* But becauſe of the Connexion betwixt what I am to ſay on it, and on the third, *When does it end?* I ſhall treat them in a looſe way together.

As my Anſwer to the firſt was intirely in the conjectural Strain, I muſt continue in the ſame here; and inſtead of pretending to give direct Anſwers to theſe two Queſtions, beg leave to wander through ſome uncultivated Fields of Speculation; where the uncommon Ideas that preſent themſelves, ſeem to open a new Light, on ſome dark enough Matters, ſuch as promiſes to render ſeveral agreeable, and perhaps uſeful Inquiries, more eaſy.

As in my Conjectures about the Place, I gave it for my Opinion, That this Proceſs was carried on univerſally, through our whole

Syſtem

Syſtem; ſo here, I think it begins as ſoon, and continues as long, as the *Syſtem* itſelf. And as I imagined that there were various Degrees of this Proceſs, in different Subſtances, and in different Places of our Bodies; here I imagine that there are various Degrees of it, in different Periods.

I muſt begin by diſtinguiſhing betwixt the *Fœtus Heat*, and the *Animal Heat:* betwixt the Heat of a *Body new dead*, and the Heat of a *living Man*. There is a ſmall Degree of Warmth in the *Fœtus*, that needs the Aſſiſtance of the maternal Heat to maintain it: and there is a Warmth after Death, which in ſome Bodies laſts very long. Both theſe, I think, are ſmall Degrees of it, but not the perfect *animal Heat* itſelf, produced or cauſed by the *animal Proceſs* which I patronize.

Leaving to Divines and Philoſophers to determine *when we began to be*, and paſſing the *ſeminal State*, I ſhall only conſider the Creature, at firſt in the Loins of the Mother, and afterwards, when arrived at a more perfect Life. I imagine then, that from its firſt being a proper Subject for our Enquiries, however ſmall and inconſiderable it may appear, that ſomething of this Proceſs has been going on in an inferior Degree; and that it laſts even for ſome time after Death

Death. In the *Fœtus*, I think it very imperfect, and not compleat, till the Animal can be called perfect: And what of it remains after Death, ſeems to be more incompleat, ſubſiſting in a Subject which is no longer an Animal at all. This Warmth of the *Fœtus* however, is very ſmall, needing that of the Mother to cheriſh and maintain it, till the new Source of Heat comes to ſupply its Place, by the Commencement of the animal Proceſs.

In order to give my Opinion, or rather Conjecture, more fully; let us caſt an Eye on the Difference betwixt a *Fœtus* and a perfect Animal. A *Fœtus* depends on the Mother, an Animal depends on himſelf, and can live by his own Functions. A *Fœtus* receives its Aliment by the umbilical Cord, from the *Placenta* and Womb; an Animal from *Pecquet*'s Duct. A *Fœtus* can only apply the Nouriſhment perfected by, and received from, the Mother; An Animal can receive, elaborate, and apply what it takes in by ſucking and the Lacteals. A *Fœtus* needs the adventitious Heat of the maternal *Uterus*, an Animal can live by its own Heat, as ſoon as this Proceſs begins.

If you ask me then, when the animal Proceſs commences, or when the Change of State from that of a *Fœtus* to that of an

Animal

Animal is made; I am ready to give it for my preſent Opinion, that this Change happens, and this Proceſs begins, when we come to breathe freely.

This, at firſt Sight, ſeems to argue Reſpiration to be the Cauſe of Heat, but I do not think it does: Other things happen at the ſame Inſtant, to ſome of which, or to a Combination of them, it may be as rationally referred.

To explain this intricate Matter fully, would prove a laborious and difficult Task, ſuch as neither my Leiſure, nor the Nature of this Undertaking, allow me to attempt. I ſhall therefore ſatisfy myſelf with pointing out the Way, and leaving it not quite ſo dark as it has hitherto been.

When we conſider the State of moſt of the *Viſcera* before Reſpiration, and what probably happens to thoſe of the *Abdomen*, as well as of the *Thorax*, upon our beginning to breathe; one thing, which has hitherto been almoſt quite unheeded, will become obvious, *viz.* that there is more than one new Circulation opened.

In the *Fœtus*, the *Lungs* ſeem to be pretty idle, there is no Air for them to take in, and they tranſmit only a Portion of the Blood, the whole of which they are deſtin'd afterwards to receive. The *Liver* ſeems hither-

to

to to have had little Employment, for it is lateſt formed, or comes lateſt to Sight, of any of the *Viſcera*; and the Blood which returns from the Inteſtines of the *Fœtus* does not paſs through it, but through the umbilical Vein directly to the Heart; there is Bile in the Gall-bladder, and biliary Ducts, but I don't think much of it has been poured forth. The Diſputes about the *Alantois* leave it a doubtful Point, whether there is ſuch a Reſervoir in the human Subject; and in Brutes, the Collection during the whole Months of Geſtation amounts to ſo ſmall a Matter, that we may ſafely ſay the *Kidneys* have had little to do. Moſt of the *Glands* in the *Fœtus* are vaſtly large in proportion to the other Parts, and have all their Receptacles full. The *Stomach* and *Guts* are full, but have emitted nothing. I preſume likewiſe that the *lymphatick Syſtem*, the *Lacteals*, *Receptacle of the Chyle*, and *thoracic Duct*, are pretty much in the ſame Condition, all full and ready to diſcharge themſelves.

In this State the *Fœtus*, which till now has been hanging as a ſucking Wen on the Mother, like ripe Fruit is ſhaken off, and muſt ſubſiſt by itſelf; Nature has furniſhed it with a Variety of different Organs, for receiving Nouriſhment, for tranſmitting, perfecting

fecting and applying it. All this Machinery, moſt of which has hitherto in great meaſure been at Reſt, is ready to play off, when the Creature is thruſt into the open Air.

What follows? In a few Moments it begins to gaſp and pant (which when I firſt ſaw, I was childiſh enough to imagine it was juſt dying, when it was only beginning to breathe) the Cheſt heaves, the Diaphragm preſſes down, the Lungs fill with Air, the *Thorax* is diſtended, and the Belly is ſqueezed. Immediately afterward, the abdominal Muſcles contracting, return the Force impreſſed on them; and by their Re-action the Cavity of the Breaſt is ſtraitned, and the Air driven out in Infant Cries. Then, and not till then, I allow it to be *an Animal.*

Some of the Effects of theſe early Motions are ſoon viſible, and it is reaſonable to conjecture, that many more of them happen, though they are out of Sight. We ſee the Stomach and Inteſtines begin to diſcharge their Loads, and ſometimes the Urine ſtream forth, as the Child is carrying from the Mother, before it is either waſhed, or the umbilical Cord is tied: And I imagine, that by the Liftings, Pantings and Heavings of the new born Creature, not only the Blood takes its new Courſe through the Lungs, but that the glandular and lymphatic Syſtems are let looſe,

loose, the chyliferous Vessels and Pecquet's Duct are fully opened; their Contents rush through the subclavian Vein into the Cistern above mentioned, a new Mixture and a new Circulation commences. As a Counterpoise to these, the external Air may be a Sort of Equilibrium; and to this Reciprocation the *animal Process*, and Continuation of *animal Life*, may be owing. As in the *Fire-engine*, the Steam of the Boiler on one Part, and the cooling the Cylinder and Weight of the Atmosphere on the other, act alternately, and make the Work go while the Materials keep in Order.

To what has been said, I have only a little to add, about the *End of this Process* or *Death*. It is generally taught, that the Life of those Animals which we call *perfect*, consists in *a continued Flux and Reflux of Blood, nervous Juice and Air, to and from the principal Organs*; and that (Death being a Cessation of these) a Man may be reckoned *dead* when he no longer breathes, and his Heart and Arteries have left off all Circulation and Pulsation. Even *Lancisi*, who has wrote best on this Subject, in his Book *de subit. mort.* p. 74. says, that *without a small Degree of Respiration, and some little Motion or trembling of the Heart, there is no Life.* In consequence of

of this Syſtem, the general Practice is, that, aſſoon as theſe Symptoms of Life are gone, all Hopes and all Endeavours to maintain and foſter the ſmall Remains of Life, are laid aſide; and the Subject, being no longer conſidered as an *Animal*, but a *Corſe*, is deſerted, and delivered over to the Undertaker.

I cannot away with this Doctrine, and abhor the Practice built on it; being of Opinion, that after the Motion of the Heart, Arteries and Lungs ceaſes, there often remains a ſmall Degree of a *vital Principle*, but ſuch a Degree as well merits Attention, the Neglect of which has had many woful Conſequences. *Moſes* ſays, *The Blood is the Life*; and I am perſwaded, that after a full Stop of all thoſe *organic Motions*, on which *Life* is ſaid to depend, the Juices frequently retain ſo much of the *animal Proceſs*, as, in many Inſtances, ſerves to maintain Warmth for a long Time; and in others, with proper cheriſhing, might reſtore Life entirely.

Not to mention the more extraordinary Accounts, though ſome of them are pretty well vouched, of ſuch as have been taken up dead to all Appearance, and reſtored to Life, after being Hours, and even Days, under cold Water: Every Age and Country afford Inſtances of narrow Eſcapes from the Grave, and ſurprizing Recoveries after lying

long for dead; and among ourſelves we have had ſome, who have lived Years after being actually buried. From the Number of theſe who have been preſerved by lucky Accidents (for moſt of them owed not their Reſtoration to either Art or Care) we may conclude, that there muſt have been a far greater Number of thoſe who might have been ſaved by timeous Pains and Skill, and who died a Death that cannot be thought of without Horror.

Some alledge, that ſuch as recover from theſe long Trances, as they are called, owe their Safety to their having the *Foramen ovale* open, which, ſay they, ſuperſedes the abſolute Neceſſity of Reſpiration. This I think not worth inſiſting on, becauſe in many Caſes, though we ſhould allow the *Foramen ovale* to be open, it does not ſolve the *Phenomenon*; for ſtill the Heart ſhould beat, and the Pulſe be felt, as in the *Fœtus*.

Such uncommon Recoveries are generally accounted for, by ſuppoſing that there remained, during the wnole Time of the Appearance of Death, ſome little Motion of the Center of the Diaphragm, by which a ſmall Degree of Reſpiration, though imperceptible to the Spectators, was continued; and ſome little trembling of the Heart, receiving and emitting a ſmall Portion of Blood,

though

though not with a Pulſe ſtrong enough to be felt, yet ſufficient to preſerve the *Vita minima.*

Our Theory (which at leaſt is innocent, and uſeful ſhould it be the Means of ſaving one in an Age) leads further, giving Hopes, although at preſent there is no Circulation, yet it may be renewed; and that one who, from a ſurceaſing of all theſe Motions, may properly enough be called *dead*, on Recovery of them, may as properly be ſaid to *come alive* again. It is ſhortly this.

The *Cauſe of animal Heat*, or, if you pleaſe, the *inteſtine Motion*, (though I can form no diſtinct mechanic Notion of it) which had been going on proſperouſly, while the progreſſive Motion of the Fluids in the Veſſels continued, is now, by the Circulation's being at a ſtand, checked, yet ſtill ſubſiſts, or proceeds in a lower Manner, perhaps like the Beginning of Fermentation or Putrefaction: By this remaining Degree of the *animal Proceſs*, the Maſs of Fluids, particularly in the great Reſervoir of venous Blood, *&c.* before mentioned, rarifying, preſſing every Way, and being reſiſted by the Valves, ſwells ſo as to fill the flaccid right Auricle of the Heart, which had been ſome time empty, and thus ſtimulating its Fibres,

which were at Reſt, ſets them a-moving a-gain (as we ſee the Heart, after being taken out of the Body, by being pricked, or having warm Water thrown on it, beats a-freſh, though it has been for ſome Time motionleſs.) The right Auricle being thus filled, and ſtimulated into a Contraction, fills the Ventricle; which being irritated, likewiſe contracts, and empties itſelf into the pulmonary Artery; whereby the Circulation begins where it left off, and Life is reſtored, if the Organs and Juices are in a fit Diſpoſition for it, as they are perhaps much oftner than is imagined.

This Theory will ſeem probable to one who knows, that in Death, firſt the Left Ventricle loſes its Motion, and then its Auricle; afterward the Right Ventricle, and laſt of all, the Right Auricle ceaſes to move; eſpecially if he reflects on what *Harvey* further obſerves, *viz.* that after all theſe are at Reſt, there remains in the Blood itſelf, before the Right Auricle, a certain *trepidating*, *palpitating*, *undulatory Motion*, like that of fermenting Liquors. Now it ſeems agreeable to Nature, that this *obſcure*, *inteſtine Motion* or *Ebullition*, which he obſerves after the Heart and its *Appendices* are at Reſt, and which I take to be the ſame with that *intromoventis naturæ energia*, by

by which *Lanciſi* ſays ſome have been reſtored to Life, without either Pains or Art; it ſems agreeable, I ſay, to Nature, that this Motion and Energy ſhould be accompanied with ſome Degree of Rarefaction; the unavoidable Effect of which is, to preſs upon, and ſtimulate the Right *Sinus venoſus* and Auricle, while it inſinuates Liquor into them: And this ſeems to be all that is neceſſary to recommence the intermitted Circulation.

How long our Fluids may retain a Fitneſs for this Rarefaction, before it exerts itſelf fully, and how long our Solids may continue ſuſceptible of a new *Stimulus*, is hard to tell, but is well worth enquiring into. Theſe may depend on the preceeding Diſpoſition of the Blood, Temperature of the ambient Medium, Treatment, and many other things which I have not thought of. That in ſome they may continue a long Time, and the Body not ſpoil, may be inferred from other Proceſſes; ſuch as *Fermentation*, where we ſee *Muſt* continue a long Time in a cloſe Cask, ere it gives any Sign of Rarefaction, till at length, the Proceſs riſing to a Height, it diſplays itſelf in burſting the containing Veſſel. It might be inferred from the Inaptneſs of ſome animal Juices to freeze, in a Degree of Cold far below the freezing Point, and from human Blood's continuing

fluid in the Veſſels many Days after Life is gone. Authors and Nature would ſeverally ſupply me with Arguments to render this way of thinking more feaſible, but I ſhall drop them all, and conclude this Article, about the *End of the Proceſs*, by declaring my Opinion, that Death does not inevitably attend an entire organic Reſt of what we call the Solids of the Body, nay that one cannot be called *dead*, till the Energy of the Blood is ſo far gone, that, tho' aſſiſted by all poſſible Means, it can never be able again, to fill, and ſtimulate into Contraction, the Right *Sinus venoſus* and Auricle of the Heart.

To relieve the Reader from this diſmal Subject, if the Nature of this Undertaking permitted, I might carry him through the wide Circle of *Life*; we might take a View of Plants as well as Animals, with the various Kinds of Lives of both, their different Degrees and different States, with their Changes of State, ſometimes advancing, ſometimes retrograde; and while we purſued the ſeveral Analogies with Pleaſure, might peradventure ſtrike new Light into theſe dark Matters. I ſhall indulge myſelf in one Contemplation only, and beſtow a few Words on it, as a Specimen of what has been entertaining to me; and hope, I ſhall be forgi-

ven a ſhort Digreſſion, if that can be called ſo, which promiſes to render ſomewhat more familiar to us the uncommon Ideas which we have advanced, in conſidering the *Fætus* and *animal* States, as well as that of *Death*. I chiefly fix on that Period, or *Pauſe* ſhall I call it, in the Life of ſome Animals, which goes by the Name of the *benummed State*. This I do not remember to have ſeen treated to any Purpoſe, and to me it ſeems curious enough, eſpecially when the Analogy betwixt it and ſome Vegetables is conſidered.

Many Plants, after taking Plenty of Nouriſhment by their Roots, bearing Leaves, (which the moſt ingenious Dr. *Hales* has ſhewn to be a Sort of Lungs to them) and breathing freely for a Seaſon, having a vigorous Circulation and Perſpiration of their own Kinds, procreating their Like, *&c.* after all theſe, on the Approach of Winter, they ceaſe gradually from all theſe Functions, breathe no more, take no more Nouriſhment, ſeem to die, and continue dead to Appearance, till the vernal Sun revives them, diſpoſes their Juices to new Motion, renews all their Functions again, gives them freſh Nouriſhment by rhe Roots, new Circulation through the Stem, new breathing through the Leaves, and reſtores them to their priſtine Vigour; rejoicing us with a

little annual Emblem of the Reſurrection.

This carries a pretty near Reſemblance to what happens annually to Bears, Marmotes, Dormice, Bats, Hedge Hogs, Swallows, and other Animals called *Sleepers*. All Winter they do not feed, they have no ſenſible Evacuations, they breathe little or none, moſt of their *Viſcera* ceaſe from their Functions. Some of theſe Creatures ſeem to be dead, and others to return to a State in ſeveral things like unto that of the *Fœtus* before Birth. In this Condition they continue, till, by Length of Time maturating the Proceſs, or by new Heat, the Fluids are attenuated, the Solids ſtimulated, and the Functions begin where they left off.

To aſſiſt us in diſcovering ſomething of the Nature of this retrograde Change, into a State where there remain few Veſtiges of animal Life, and even little or no *Circulation* or *Reſpiration*, and in many Particulars very much reſembling our own Deaths, I ſhall point out three obvious things, which have the moſt ſenſible Influence on the two laſt named Functions; the three are, *Diet*, *Exerciſe* and *Air*.

As to the *firſt*, every one's Experience tells him, that he has a higher and quicker Pulſe, as well as a more frequent and larger Reſpiration, after feeding; and, *cæteris paribus*,

ribus, in Proportion to the Quantities of new Chyle, which enter the Blood. On the other hand, after long faſting, the Pulſe is lower and ſlower, and the Lungs have ſo little Play, that the Reſpiration is hardly to be ſeen, if there is no other ſtimulating Cauſe acting at the ſame time.

Secondly, *Muſcular Motion* quickens the *Circulation of the Blood*, and that in Proportion to the Vehemence of it. Lying quiet, in an eaſy Poſture, where feweſt Muſcles are employed, the Pulſe is ſloweſt; ſitting, it riſes a little; ſtanding and walking, yet more and more; and running raiſes a Fever for the Time. I need not repeat the ſame things of *Reſpiration*, which is influenced pretty much in the ſame Way, in Proportion to the Number of Muſcles acting, and the Violence of their Contractions.

Thirdly, Theſe Functions depend much on the Temperature of the Atmoſphere we live in. In a *hot Air*, our Inſpirations are more full and frequent, and our Blood ſwelling, circulates with more Violence. In a *cold Air*, *cæteris paribus*, we breathe much ſeldomer, and with leſs Diſtention of the Cheſt; and, the Blood ſubſiding, the Circulation is calmer.

If we take a full View of the Influence which theſe three have on the moſt impor-

tant

tant animal Functions, and ſuch as are moſt ſubject to our Senſes, I think we have a Clue to lead us a good Way into the Nature of this Change of State: For, ſince we find in ourſelves, that moſt of our Functions, and particularly the *Circulation* and *Reſpiration*, are increaſed by *Diet*, *Heat* and *Exerciſe*; and that, in Proportion to the Diminution of theſe three, the other two are leſſened; it ſeems no hard Matter to conceive what happens to the *Sleepers*, and that there may be ſtill greater Effects of a Concurrence of theſe three in ſuch Animals, (whoſe Juices perhaps differ from ours, eſpecially at certain Seaſons, being fitted by Nature to their Neceſſities) and that a Creature, receiving no new Chyle at all, making no *Loco-motion*, and being in a cold Place, in a cold Seaſon, may ſubſiſt without *Reſpiration*, and perhaps with little or no *Circulation*, and return either to a State, in many things reſembling that of a *Fœtus*, or to one a-kin to that of the Vegetables above mentioned in Winter; or near to that of a Man who ſeems dead, or is really ſo for the Time, but retains a Principle of *Reviviſcence*.

Having been carried vaſtly farther than I dream'd of at ſetting out, I ſhall not only drop the Application of this, which every intelligent Reader can proſecute, but, curbing

ing both my Imagination and Reaſonings, abſtain from entering on a Number of Matters which offer themſelves, both as Arguments to prove, and Illuſtrations to clear up, theſe Opinions and Conjectures.

From what has been already ſaid, I hope I may be allowed to conclude, that, ſince it was never known, or at leaſt demonſtrated, that any Fluid acquired Heat, in the coarſe mechanic Way, by Friction with a ſolid Body; ſince it was never known or demonſtrated, that ſo conſiderable a Change was made on the Structure of the minute Parts of Bodies, as is made in this Proceſs, without producing Heat at the ſame Time; Since in Fermentation, Putrefaction, *&c.* the Heat is not pretended to be owing to the Veſſels containing the changed Subject, but to what happens to its minute Parts in undergoing that Change: Since theſe things are ſo, I ſay, I may conclude, that it ſeems an unphiloſophick Partiality for the Mechanicks, to maintain, that our Juices have all their Heat communicated to them from the Solids, and acquire it by rubbing with the Veſſels. I ſhall end with a Conjecture propounded in theſe ſhort Queries.

Q. 1. Since there are Proceſſes, in which Mixtures will not effervеſce, without being ſhaken or ſome-how moved; may not this

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animal Proceſs be ſomewhat of that kind, owing only its going on proſperouſly to the circulatory Motion, as a *conditio ſine qua non*?

Q. 2. Since there are Proceſſes in which Mixtures maintain an Effervescence, while there is a conſtant Addition of ſome one or other Ingredient, to keep up the Heterogeneity of the Mixture, and when that new Infuſion ceaſes, the inteſtine Motion ceaſes alſo; may not this Proceſs be of that kind? or,

Q. 3. May it not be a Compoſition of both kinds?

Of the hot and cold Pediluvium.

Though there are few Practices more common, than putting the Feet into warm Water, yet the Uſes of *warm Bathing* in general, and of the *Pediluvium* in particular, ſeem to be ſo little underſtood, that they are often prepoſterouſly uſed, and as injudiciouſly abſtained from. It is therefore to be wiſhed, that the Principle on which they are practiſed were cleared up, and eſtabliſhed on a ſound Foundation, which hitherto has not, at leaſt generally, been.

I ſhall not pretend to treat the Subject either fully, or orderly, but offer my Thoughts on

on it, in the Form of looſe Hints, to be digeſted and improven afterward, if more Experiments, and a ſtricter Examination, ſhall diſcover that they deſerve it.

I have converſed with many, and wrote to others, who were reckoned no mean Philoſophers, asking what they expected from a *warm Pediluvium*, and in what Manner it operated; and always received pretty uniform Anſwers, ſuch as, That *Fire* and *Water* are the two principal and univerſal *Relaxers*: That warm Bathing, by *relaxing* and *enlarging* the Capacities of the Veſſels, makes a *Derivation* of the Fluids into the Parts bathed, and a *Revulſion* from thoſe at a Diſtance: That by their *relaxing* and *enlarging* the Capacities of the Veſſels of the immerſed Legs, theſe become able to contain a greater Quantity of Blood, and conſequently a ſmaller Portion remains in the ſuperior Parts: That this *Revulſion* from the Head or Breaſt, when aggrieved, brings a ſudden Relief, by there being ſo much leſs Impetus on the oppreſſed Parts: That in the Small-Pox, the Danger of which is eſtimated by the Quantity of Eruption on the Face and ſuperior Parts, bathing the Limbs conduces to increaſe the Eruption on the Extremities, and diminiſh it on the Face and Breaſt.

Theſe make a pretty plauſible Theory, found-

ſounding finely in a Prelection, and, having the Appearance of being very philoſophical, cannot miſs to be greedily ſwallowed down by young People. This is unlucky, but what is of much worſe Conſequence is, that this Doctrine is generally believed, and founded upon in Practice, even by thoſe who have been much and long verſant in it; tho' after all, it will not, in my Opinion, ſtand the Teſt of a thorough Examination and Experiment.

That *Fire* may be reckoned a *Relaxer*, in ſome Senſe, I ſhall not diſpute; though I think we have very confuſed Ideas of *Relaxation* and *Conſtriction* in this Queſtion: But that the principal Effect of the hot Water *in Pediluvio*, cannot, with any Propriety, be called a *Relaxation of the Veſſels*, I am pretty poſitive; and that one might as juſtly ſay, when *Heat* is applied to a Bladder half full of Air, and the Bladder thereupon ſwells to its full Dimenſions, that the *Heat relaxes* the Bladder, when indeed it only *expands* the included Air.

There is a Sort of Philoſophy ſubſervient to Practice, which neither beginning or ending far back, at the remote and abſtruſe Cauſes of Phænomena (where moſt of our Reaſonings are not only hypothetical and precarious, but generally uſeleſs) reſts ſatisfied with

with nearer and more intelligible Cauſes; where our Judgment of the Effects is leſs liable to miſtake: Or rather, we purſue from the Effects and Conſequences, backward to the Cauſes, but no further than theſe are uſeful, and can be well eſtabliſhed. I know not, for example, what makes Blood occupy more Space when warm than cold: I do not trouble myſelf with an Enquiry, whether this is owing to the Quantity of Air, or of a ſulphureous Principle, or of any other thing in it; it is enough to a practical Philoſopher, to know that *Rarefaction* is the conſtant Effect of the Blood's being heated, the natural Conſequences of which, without riſing to any higher Theory, aſſiſt him in regulating his Practice.

You tell me, that when I put my Feet into warm Water, the Veſſels *relax*: I come in from the cold froſty Air, with my Veins appearing no bigger than Threads, and after being ſome Time by a warm Fire, when theſe ſwell to three times the Size, you tell me that the Heat of the Fire has *relaxed* the Veſſels, and enlarged their Capacities. I can neither believe nor underſtand this Explication, which ſuppoſes the Veſſels of the heated Parts to become like larger Pumps, ſucking to themſelves a greater Proportion of Liquors than they uſed to do, and leaving

ing leſs to be diſtributed through the reſt of the Body.

I can conceive no *Relaxation* here, but what is owing to the Rarefaction of the Blood, which, when warm, occupies a larger Space, and diſtends the Veſſels. If the Blood did not thus ſwell, the Weight of the incumbent Atmoſphere would keep the Veſſels ſtill applied to it, however ſmall its Volume was; and if there was no Blood to diſtend them, they would collapſe, heat them as much as you will.

The two great Powers, diſtending and contracting the Veins, I take to be the *contained Blood*, and the *Weight of the Atmoſphere*. The natural Elaſticity and Strength of the Coats of the Veſſels are indeed a real Force, but this ſeldom needs to be conſidered, being pretty uniformly the ſame, while the Conſtitution is not greatly changed. The moſt varying of theſe three is the Blood, which at one Time occupying an Area vaſtly larger than at another, ſuſtains a far greater Weight of the Atmoſphere; therefore the Rarefaction of the Blood muſt ſometimes be very great. The following I think an Experiment that overturns the common Theory, and gives a good deal of Light into what happens by the warm *Pediluvium*.

To bring the Matter to a ſort of Demonſtration,

ſtration, in a cool Evening, *October* 2d, before Supper, I cauſed two Youths, the one of the Age of fourteen Years, the other of thirteen, both ignorant of the Purpoſe of the Experiment, to put their Legs in warm Water; after examining the Colours of their Skins, and the Size of the Veins in their Hands and Faces; and while they continued in the *Pediluvium*, I counted their Pulſes exactly by a Watch meaſuring Seconds, and obſerved,

That at 8 o'Clock, immediately after the Immerſion to the gartering below the Knee, in Milk-warm Water, their Pulſes beat in a Minute, the firſt 66, and the ſecond 84, as before Immerſion. At 15 Minutes after 8, the Water a ſmall Time before being increaſed in Heat, tho' not to the Degree of the Warmth of Blood; the ſecond yawned and began to breathe quicker: their Pulſes then beat, the firſt 69, and the ſecond 88. About 25 Minutes after 8, the Water being made full Blood-warm, the Veins of their Hands were greatly ſwelled, the ſecond had his Face flushed; their Pulſes beat, the firſt 75, and the ſecond 94. At 35 Minutes after 8, both of them had the Veins of their Faces and Hands very much diſtended; the firſt ſaid he was greatly diſpoſed to muſing; the ſecond was ſleepy, with his Face ſo red that I was afraid of

hurting him, by purſuing the Experiment any further: Both their Pulſes, which in the beginning were ſoft and ſmall, became very full and hard; and beat, the firſt 80, and the ſecond 98, in a Minute. Then I made them ſet their Feet on a ſpread Carpet, ſitting ſtill without any Motion, as they had done before, and reckoned their Pulſes, which at 40 Minutes after 8 beat, the firſt 71, the ſecond 90; and at 46 Minutes after 8 their Pulſes became leſs and ſofter, beating, the firſt 69, the ſecond 88. A little after 9, the Fluſh was off the ſecond's Face, and their Pulſes were become quite ſoft and ſmaller, the firſt 66, and the ſecond 85, almoſt as they ſet out.

This I take to be an *experimentum crucis* in the Matter, giving a true Explication of the Manner whereby hot bathing operates; and demonſtrating, that the Diſtenſion of the Veſſels is owing chiefly to the Rarefaction of the contained Fluids.

My Opinion of the warm *Pediluvia* then is this. The Legs becoming warmer than before, the Blood in them is warmed; this Blood rarifying, diſtends the Veſſels; and not ſtagnating, but circulating, it imparts a greater Degree of Warmth to the reſt of the Maſs; and as there is a Portion of it conſtantly paſſing through the Legs, and

and acquiring new Heat there, which Heat is, in the Courſe of Circulation, communicated to the reſt of the Blood; the whole Maſs rarifying, occupies a larger Space, and of conſequence circulates with greater Force. The Volume of the whole Blood being thus increaſed, every Veſſel is diſtended, and every Part of the Body feels the Effects of it; the diſtant Parts a little later than the firſt heated ones.

In the above Experiment, not only the immerſed Parts and lower Extremities ſwelled, but the whole Body; and the Pulſes of the Wriſts and Temples beat fuller and quicker, as well as thoſe derived from the deſcending *Aorta*: There can be no *Revulſion* here.

If the Conſequences were not too ſerious, I could be diverted with the prepoſterous Application of the warm *Pediluvium* in ſome Caſes, ſuch as in Hæmorrhages of the Noſe or Lungs, Over-fulneſs of the Head or Breaſt: In theſe and the like they are uſed with Intention to draw the Blood down to the Feet, or to keep it from aſcending impetuouſly to the Head and Trunk: But alas! the contrary to what is intended comes frequently to paſs; the Blood heated in the Feet, encreaſing the Warmth of the whole Maſs, augments the Diſeaſe.

Numberleſs Caſes are to be ſeen, in very good Authors, where the Benefit obtained by it is attributed to its making a *Derivation* into the Parts immerſed, and a *Revulſion* from thoſe affected, becauſe they are relieved; when truly the Cure is performed by the direct contrary Method of operating, *viz.* by a greater Force of Circulation thro' the Parts affected, removing what was ſtagnating or moving too ſluggiſhly there.

I am of Opinion, that where there is an irreſolvable Obſtruction, (though by its taking off from a *Spaſm* in general, it may ſeem to give a Moment's Eaſe) we never find the ſmalleſt Benefit by warm Bathing, or that it draws from the diſtant Parts; but that it often hurts, by puſhing againſt Matter that will not yield, with a ſtronger *Impetus* of Circulation than the ſtretched and diſeaſed Veſſels can bear, haſtening the Cataſtrophe in bad Caſes: So that where there is any Suſpicion of a *Schirrhus*, I would never order a Courſe of warm Bathing of any Sort.

On the other hand, where Obſtructions are not of long ſtanding, and where the impacted Matter is not obſtinate, warm bathing may be of great Uſe to reſolve them quickly. In recent Colds, with ſlight humoral Peripneumonies, they are frequently an immediate Cure. If this is performed by the *Pediluvium*,

luvium, it is generally termed a *Revulſion* from the Breaſt; but with no more Propriety, than if one ſhould ſay, that a *Revulſion* from the Breaſt was made by a Bowl of Sack Whey, hot Punch, or the old Cure of two Bottles of Wine and a red Herring; which produce frequently the ſame Effect, and (though not ſo ſafely) by a ſimilar Operation, *viz.* increaſing the Force of the Circulation, opening the Skin, and driving freely through the Lungs that *Lentor* which ſtagnated, or moved ſlowly, in them. As thus conducing to the Reſolution of Obſtructions, they may be conſidered as ſhort and ſafe Fevers; and in uſing them we imitate Nature, which by a Fever often carries off an obſtructing Cauſe of a chronical Ailment.

It is common to wonder, that the Circulation of the Blood ſhould have ſo long continued a Secret; but it is as wonderful, that *Medicine* ſhould have received ſo little Improvement from this important Diſcovery. The Antients, who were ignorant of it, are excuſable for the Badneſs of their Theory of the *Pediluvia:* They knew nothing of the ready Communication of all the Parts of the Body by Means of it; and wanting our Lights, contrived their *Attractions*, *Derivations* and *Revulſions*; of which the far greater Part is either not true, or not to the

Purpoſe; yet ſuch is our idle Veneration for Antiquity, that we are at great Pains to adapt the modern Diſcoveries to that *Jargon*, which Time only has made ſacred. *Harvey* performed Wonders, and thoſe who wrote ſoon after him did very well, but could not be always on their Guard, and failed of applying the Doctrine of the *Circulation* in ſome Diſquiſitions in which it might have been of Uſe: they remained ſatisfied, in treating the Subjects where the Application of it was leſs obvious, with continuing in the ſame Strain with the Antients. The ſucceeding Theoriſts again, miſled, by ſeeing the ſame Reaſonings, which were in the beſt Authors who wrote before the great Diſcovery, continued by thoſe who wrote after it, went on in the ſame Tract. And now, that *Bellini*, *Boerhaave* and *Hoffman* have either not conſidered it, or not explained it, fully; it is not to be wondred, that their Scholars continue in the ſame Path.

Bellini, in enumerating the Advantages of hot bathing, and Manner of its operating, mentions the Water's compreſſing by its Weight, penetrating and mixing with the Fluids, diſſolving and carrying away what is viſcid or ſtagnating *&c*, but miſſes entirely the *Rarefaction* in warm bathing. He names it indeed in treating of the *Pediluvium* and

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Inſeſſus, yet appears not to have this Opinion fully, becauſe he brings in the putting one's Feet into warm Water only as a *commodum quoddam particulare*; led to it, I ſuppoſe, by its Effects on the *Uterus*, as an *abdominal Viſcus*; and ſeems not to reflect on its Action on the ſuperior Parts.

I ſhall not mention *Boerhaave* farther than to ſay, that I, and as many of his Scholars as I have converſed with, learned from him the Doctrine which I have been endeavouring to overturn.

As *Hoffman*'s Works are a vaſtly uſeful Treaſure of the Theory and Practice of Medicine, I ſhall take the Liberty to conſider his Opinion on this Head a little more fully. He frequently points right, by touching at the Dilatation of the Blood by Heat, when writing of the hot Bath; and likewiſe mentions it when he ſpeaks of the *Pediluvium*; but where he treats moſt expreſly of it, he falls in preciſely with the general Opinion, particularly he has theſe Words, *Tom.* 1. *p.* 466. *Dum enim humore illo calido foventur pedes, nervoſæ, tendinoſæ ac muſculoſæ in iis fibræ ex quibus intercurrentibus vaſis coagmentati ſunt, laxantur, remittuntur, pori & tubuli antea conſtricti ampliantur, ſanguini aditus humoribuſque debitus redditur commeatus; quo*

fit, ut impetus aliis partibus incumbens divertatur, ac cum inſigni levamine ad inferiora derivetur. Here I muſt differ from him, and think him led into this Sentiment purely by his Deference for the Antients and the common Opinion: and though immediately after he points at the Truth, when it was unavoidable, yet he relapſes again, adding, *Et certe laudatiſſimi ſunt uſus ad derivationem, in morbis, qui à congeſtionibus ad caput & pectus, per ſpaſmos inferiorum maximèque hypochondriorum factis, ſubnaſcuntur; ut præter ſoporoſos affectus omnes ferè capitis morbi ſunt,* &c. *Narium, hæmorrhagiæ nimiæ,* &c. *nec non quæ pectus affligunt, aſthmata convulſiva, dyſpnæa à copia ſanguinis, hæmoptyſis.* Here I preſume to think him wrong, having heard of much Miſchief done by this Theory, which nothing but frequent Warnings in Practice made me examine and relinquiſh.

What he calls *taking off a Spaſm*, and *relaxing the Solids*, I grant to be of vaſt Uſe in ſome Caſes, but imagine, that Heat diſtending the contained Fluids, preſſing againſt the *ſpaſtick* Veſſels, is for the moſt part the true Theory of taking off the *Spaſm*: though I do not deny, that there is ſome *agreeable Senſation*, and *undulatory Motion*,

on, as they call it, of the whole *genus nervoſum*, that may relieve from Pain, where there is really nothing done toward the Cure; for we oft ſee the Diſeaſe return with double Force after leaving the warm Bath.

I'm in ſome Doubt about what he ſays of relaxing the rigid tenſe Fibres, conſtricted by a *Spaſm*; from this Conſideration, that many of the *Phænomena*, which induce us to imagine, that *Spaſms* are owing to a great Power exerted by the Solids in contracting themſelves, are really owing to a Want of Power in ſome of them to contract as they ought, and as they uſed to do: *Ex. gr.* on *Inanition*, we have frequently *Convulſions*, owing to the Want of Power in ſome *Antagoniſts*. When we ſee a violent Convulſion, we immediately think of the great Force that ſeems to be exerted; but do not reflect, on the great Want of Force which is the Occaſion of it. In a Caſe of this Kind, when the warm Water takes off the Spaſm, it has been thought to do it by ſoftening and relaxing the too rigid, ſtrong, pulling Parts; but I imagine it owing rather to the filling all the Veſſels with new rarified Fluids, and thereby reſtoring the Equilibrium; and that in this conſiſts much of the true Philoſophy of theſe *agreeable Senſations*, and *undu-*

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latory Motions and *Vibrations* ſo much talked of.

What is juſt now ſaid may be confirmed from the common Practice of curing *Convulſions from Emptineſs*, by adminiſtring alcaline Spirits, compound Waters, and other warm Cordials; as alſo by warm bathing of any kind: likewiſe from what happens to thoſe who are ſubject to ſome nervous Diſorders, particularly your low hyſteric People, who have their Veſſels ill, or unequally filled; they find frequent Relief from *Head-achs* by the *Pediluvium*, and obtain the ſame likewiſe by the laſt mentioned Medicines, Wine, and the reſt of that heating and rarifying Claſs. I would fain hope therefore, that henceforth, in theſe Caſes, the Cure by hot Water may not be imagined always to operate by *Revulſion*.

It is eaſy to ſhew, that this juſtly eſteemed Author's Practice correſponds with his Theory. He uſes warm *Pediluvia* in *Hæmorrhages*, in a *ſpaſmodic Aſthma with Suſpicion of a Polypus in the Heart*, in a *Vertigo* and *Hæmoptoe*, and ſome other Caſes, where I ſhould be afraid to uſe them; and continues to preſcribe them with Encomiums, tho' ſome of his Correſpondents paint their bad Effects in pretty ſtrong Colours,

lours, *licet provido ſatis tepore adhibe-rentur.*

At the ſame time I muſt do him Juſtice, by taking notice that, both in *Theory* and *Practice*, he comes very near the Opinion I have been endeavouring to eſtabliſh: for, in his Theory of hot bathing, he is ſo clear about the *Expanſion of the Blood*, and *ſwelling of the Body*, that it is ſurprizing he ſhould omit them in other Parts of his Works, where the Conſideration of them ſeems of great Importance. And, in his Practice, though he extols them by ſuch Expreſſions as theſe,—*ferè divinæ ſunt virtutis Pediluvia;—præſtantem vim, humores a pectore derivandi poſſident;—ad revellendum ſanguinis ad inferiora motum, egregium ſpondent uſum*,—and the like; yet he frequently cautions againſt their being too hot; and if this was carefully attended unto, there would little Hurt be done by them; becauſe the cooler the Water, the Effects of it are the nearer to a *Revulſion*, and quite cold Water for the moſt part makes one.

The only eſſential Difference betwixt his way of thinking and mine is this: I preſume to maintain, that the *warm Pediluvium* never makes a *Revulſion* from the ſuperior Parts, when it procures what he calls a *Relaxation*,

laxation, and I a *Distension*, of the Vessels; and that the more the Vessels of the Legs *swell*, or, as he says, are *relaxed*, the greater is the Force of the Circulation every where very soon after.

One Passage more from this Author will shew how near he comes to the Truth, and at the same time give a notable Instance how obvious it may be, and yet pass unobserved, when there is a powerful Prejudice against it. *Tom.* VI. *p.* 84. discoursing of the Effects of *Opium*, he says *Capitiluvia, pediluvia, balnea ad somnum blandum disponere, in foro medico notissimum, quod tamen non alia ratione fit, quam quod expansionem ipsis humoribus inducant, unde etiam habitum corporis turgidulum atque inflatum reddunt.* This Observation is just, and hitherto the Reasoning good; the natural Inference from which seems to be, that since these warm Baths make all the Humors expand, and the whole Body swell, they likewise procure a greater Flow of warm rarified Blood through the Head, and thereby dispose to sleep. But the preconceived Opinion, and the Doctrine of *Revulsion*, is so strong, that he concludes *Sicque lentiùs succedit sanguinis motus per caput, & placidius subsequitur somnus.* As if Sleep could not be induced by filling the Head with

with a greater Quantity of Blood, which has frequently that Effect: For, that the *ſanguinis motus per caput* does not ſucceed *lentiùs*, after a large Doſe of *Wine*, *Opium*, *warm Bathing*, or other expanding Cauſe; may not only be inferred from the Laws of the Circulation, which make it neceſſary, when the Blood is expanded, and the Heart throws out a greater Volume of it, that the *carotid* and *vertebral* Arteries have their Proportion; but is plain to Experience, from the Redneſs of the Face, and Tumidneſs of the Jugulars, which return the Blood from the Head.

I do not deny, but from ſcattered Sentences of the Authors by me named, and many others, may be picked up a Foundation for all I have ſaid; yet not ſufficient to turn the Stream of Reaſoning and Practice into a right Channel. Either they have not underſtood it perfectly, or not communicated it diſtinctly; otherwiſe the univerſal Doctrine and Practice of this Day would not have run in another Courſe; and I ſhould not have owed my preſent way of thinking to Experience, but to my Books and Maſters.

Near thirty Years ago, a Reverend Divine, in a Fever with a Head-ach, without any Delirium, or other threatning Symptom, had his Legs put into hot Water: at firſt he

ſaid

ſaid it was very agreeable, then he ſpoke much, and in half an Hour became quite delirious, and continued ſo till next Day, that he died. This was imputed to a too ſtrong *Revulſion*, which had not left that Force of Circulation through the Head, which was neceſſary to maintain the Functions; but it is more probable, that his Death was owing to a greater *Impetus* on the Brain than it could bear. This was the firſt Caſe which ſtumbled me at the Doctrine I had imbibed in the Schools. I met with others in a ſhort time, which appeared very ſtrange to me; ſuch as, a wiſe and ſober Matron's putting her Feet into warm Water, being attended with a Delirium, as if ſhe had drunk Champaign to Exceſs; a young Nobleman, after going into a warm Bath, ſinging and raving at firſt like one drunk, and a little after raging like one quite mad: Both recovered as ſoon as they became quite cool. Thereon I uſed the warm *Pediluvium*, and carefully examined the Effects of it on myſelf, and experienced an agreeable *Reverie* and Diſpoſition to ſleep, the common Effects of Wine with me. Then I begun to ſuſpect that it acted chiefly by rarefying the Blood, and deriving more to the Head, oppoſite to the common Opinion; and ſoon afterward became convinced of it by numberleſs Inſtances.

Since

Since that Time I have uſed the *Pediluvia*, when rightly tempered, as ſafe Cordials, by which the Circulation can be rouſed, or a gentle Fever raiſed; with this Advantage over other Cordials and Sudorificks, that I can take off the Effect of them when I pleaſe, and that they operate without throwing into the Blood any heating Drugs, which cannot be ſo eaſily diſcharged out of the Body.

Though I reckon the Rarefaction of the Blood, however neglected, to be the moſt important Conſideration, when we preſcribe this Method of Cure; yet I am far from believing it to be the only one: And perhaps it will be expected, I ſhould ſay ſomething of the Reſt, which however I ſhall paſs over very ſlightly, being pretty fully treated by *Galen*, whoſe Reaſoning upon them, with very little Alteration, has continued down to this Day.

Opening the Pores by ſoftening and relaxing the Skin, Humectation of the Body by imbibed Water, taking off a Spaſm and eaſing Pain; theſe, with Revulſion from diſtant Parts, ſeem to be the chief Topicks inſiſted on. To the laſt of theſe I need ſay nothing further.

No doubt, they do ſoften and relax the Skin, which may be of conſiderable Uſe in clear-

clearing the Pores, and forwarding the Perſpiration of the immerſed Parts; but this cannot be of great Conſequence, when the Legs only are bathed, for their Surface bears only a ſmall Proportion to the reſt of the Body. And in the Small Pox, where ſo much is expected from them, I think their frequently tumultuous Operations render them ſuſpected, and at beſt of very doubtful Effect: At leaſt the univerſal Practice of it, familiar with ſome, is empyrick and bad, as all univerſal Practices are, not making Allowance for the Difference of Caſes. I much prefer *Monſ. Martin* of *Luſanne*'s Method of bathing the Skin, not only of the Legs, but of the Face and whole Body, with a ſoft Cloth dipt in warm Water, every four Hours till the Eruption; by this Means the Puſtles may become univerſally higher, and conſequently more ſafe.

As to the Humectation of the Body by Water mixing with the Blood, it may be in Part true, but there is much more imputed to it than it deſerves. To this is attributed the ſwelling and encreaſed Fulneſs of the Body in general, which we have ſhewn to be owing to another Cauſe, *viz.* the Rarefaction and Attenuation of the Blood, which may be produced almoſt as readily by Heat without Moiſture; for warm Bottles applied

to

to the Feet, putting them into hot Sand; the Fumes of Spirit of Wine; Bladders full of hot Water, or the Heat of a dry Bagnio; do the ſame thing as effectually as Immerſion into warm Water. Nay further, I doubt whether the Body, in a Pediluvium, imbibes more than it loſes; conſidering that the *emitting* or *perſpiring* Veſſels are dilated, as well as the *admitting* ones, however bibulous our Imaginations are apt to make them; and that there is now a greater Force of Circulation driving outward, enough to over-balance the additional Weight of Water; which I purpoſely omitted in enumerating the Effects of this Method of Cure, becauſe it ſeem'd inconſiderable when the Legs only were bathed. Some of the Phenomena that ſeem to favour the *Dilution* of the Blood, by a Quantity of Water imbib'd through the Skin, ſuch as the Running of the Noſe, and Drought's being quenched, may very well be accounted for in another Way: for the increaſed *Impetus* of the *rarified* and *attenuated* Blood, making a more forcible Circulation through the *Schneiderian Membrane*, and *ſalival Glands*; may thin, and increaſe the Quantity of *Mucus* and *Saliva*; whereby the Noſe runs, and the Drought is quenched.

Having already treated of the warm Baths

taking off Spaſms, and *eaſing Pains*, as far as theſe depended on *warming* and *rarifying* the Maſs of Blood; what I am further to add on this Head relates as well to the *cold Pediluvium* as the *hot*, and indeed admits Application to many other Things. Baths of both kinds ſeem to have an immediate Influence on the whole *nervous Syſtem*, which we can but ill explain, or little underſtand, being ignorant of the Conſtruction of the Organs of *Senſe* and *Motion*, and able to make only very imperfect Gueſſes about the Theory of *Senſation*, *muſcular Motion*, and the mutual Influences of *Soul* and *Body*.

In violent Pains, hot and cold Bathing, as well as a great many other Things, produce the ſame Effects, and in the ſame Way in one Reſpect, *viz.* aſſwaging the Pain, by taking off the Attention from it. When one is much pained, withdrawing the Action of the Nerves correſponding to the affected Part, employing many Nerves, or ſome of them violently another Way, will ſeldom fail of giving Eaſe. *Muſick* has ſo great Power, to aſſwage the Pains both of Body and Mind, as to have given Riſe to the Fable of *Orpheus*'s charming for a while the infernal Torments. Strange amuſing Stories will take off almoſt any Pain for a little.

Sud-

Sudden News, whether good or bad, Surpriſes or Affronts, not only remove the Hiccup, but greater Pains. The Tooth-ach has been cured inſtantly by a Threatning of a Box on the Ear, or pretending an Attack upon a Lady's Honour. One Pain is commonly a Cure for another. Applying Garlick to a diſtant Part, Burning and Bliſtering cure all in this Way.

In examining carefully the Effects of the warm *Pediluvium*, tried on myſelf, I ſometimes obſerve them to tally to thoſe of *Muſick*, and imagine the *Pediluvia* operate much in the ſame Manner; though I do not know whether Muſick acts by exciting an agreeable *Vibration* of the whole *nervous Syſtem*, in conſort with the Nerves of the Ear, or by concentering the Attention of the Mind, and the Employment of the *Senſorium commune*, to the Sounds. In *Bathing*, the infinite Number of ſmall *nervous Papillæ* ending in the Skin, and eſpecially the more ſenſible Ones of the Feet and Hands, deſigned for the delicate Senſe of *Touching*, being tickled; and putting the whole *Genus nervoſum* in conſort with them, into a delightful undulatory Motion; the Soul attends to this new agreeable Feeling, and finds a ſweet Avocation from the former Torment. Much the ſame happens

in *cold Bathing*; not indeed as the Senſations are *pleaſant*, but as they are *lively* and *ſtrong*, and thereby have the ſame Effect, diverting the Attention from the preceeding Pain, and employing the Soul, as a *ſentient Being*, another Way.

Thus far the *hot* and *cold Pediluvium* have the ſame Effects; in other Reſpects they differ widely, and have generally quite contrary ones. Theſe I leave an intelligent Reader to make out, from the Principles ſcattered through what is already ſaid; and, inſtead of treating the *cold Pediluvium* directly, I ſhall give the Hiſtory of a notable Caſe, that probably would have been a fatal one without the Practice of it, and from which the Doctrine may in part be gathered.

A Gentleman of twenty ſeven Years of Age, who ſeem'd to have nothing amiſs in his Conſtitution, and naturally not coſtive, from catching Cold, as he imagined, *July* 7. 1739. began to complain of a ſlight Pain of his Breaſt, Stomach and Guts, and to be uneaſy from Coſtiveneſs. As every Body has a *Noſtrum* for ſuch Complaints, when not exceſſive, he tried ſeveral Cures of his own; but, growing daily worſe,

On the 10th he called Dr. *Young*, who, that Day, and the 11th, adminiſtred *lenitive* and purging Clyſters, *laxative Ptiſans*,

ſans, Solutions of Manna and of Salts, Boluſes and Pills of different Strengths and Kinds.

The 11th at Night I was called, and found him rendering his Clyſters as they were injected, without any *Fæces*, vomiting every thing taken by the Mouth, reſtleſs, and greatly pain'd from the Navel to the *Os pubis*, with a low Pulſe. We tried that Night to ſtop the vomiting, by Doſes of Salt of Wormwood with Juice of Limon, and to open his Body by *Tinctura ſacra*.

In the Morning of the 12th we were told, that he had thrown up all his Medicines ſoon after they were taken, and had continued to vomit every thing he had drunk through the Night. He had no Sleep, and was crying out with the Violence of the Pain of his lower Belly. His Pulſe being a little fuller, and more frequent, he was bled plentifully. To ſtay the vomiting, which was firſt of all neceſſary, and without which nothing could be done to Purpoſe, we gave him, every Half-hour, two Spoonfuls of a ſtrong Tincture of dry Mint in good ſimple Mint-water. This ſettled his Stomach, as it ſeldom fails to do. Our next Deſign was to procure him Paſſage downward; which we durſt not attempt by a full Doſe of any Purgative, leſt, by the Irritation, the vo-

miting might be provoked anew: We propoſed therefore to melt down what obſtructed the Gut, by giving every Hour one Pill of equal Parts of Soap and Aloes, with two Spoonfuls of the Tincture of Mint, to prevent his throwing them up. This Day he took ten Pills, had Fomentations and Clyſters repeated; was in a warm Bath, and had a Lamb's Skin hot from the Animal applied to his Belly; but all in vain: The Conſtipation of the Bowels continued obſtinate, the *Hypogaſtrium* became ſwelled and hard, and his Pain almoſt beyond human Sufferance.

The 13th he continued without Sleep, or a Moment's Eaſe, ſweating frequently, and crying out with the inceſſant Torment of his Guts. He continued the Soap and Aloes Pills every Hour till he had taken twenty three, all which he retained; as likewiſe a Solution of Manna in Whey; but nothing paſſed. In the Afternoon Dr. *Clerk* was called. He was again let blood, and got Clyſters of a Decoction of Prunes, with four Spoonfuls of ſweet Oil added. At Night he ſwallowed a Bolus of ſweet Mercury, three Hours after which he threw up every thing he had taken; and his Caſe was look'd on as deſperate, the Fever increaſing, and the Agony intolerable. This Day we talked of trying

trying the Quickſilver, or the Bellows. The *cold Pediluvium* was alſo propoſed, but put off.

On the 14th, after he had paſſed a miſerable Night, without Sleep, in the moſt extreme Pain, when there appeared no Hopes from any of the common Methods, I renewed the Propoſal of the *cold Water*, and advanced ſuch Arguments for it, as made the Gentleman eager to try it; and it was agreed to.

He was carried into a cold Room, with his Limbs naked. Every ſecond Minute a Porringer of cold Water was daſhed on him, beginning at his Feet, and riſing gradually till toward the End of the Operation it was thrown as high as the *Pubis*. We made him ſometimes walk about, ſometimes ſtand on the cold wet Floor, and frequently plunge his Feet alternately in a Tub of cold Water. He found ſoon that it gave him Strength, and was rather comfortable than diſagreeable, for near half an Hour: Then he began to cry out as before, vomited once, was fatigued, and complained bitterly of his Belly being more ſwelled than ever, and of very ſharp Gripes. Immediately after this, at the End of 35 Minutes, he purged on the Floor before he could be got to the Stool, where he had a large liquid Evacuation, with

ſome little indurated *Fæces*. He went to Bed much relieved; but ſtill uneaſy with the Soreneſs of the Parts, and the Remainder of ſo great a Load. In the Afternoon he got an emollient Clyſter, along with which he evacuated ſome hard Excrement. At eight in the Evening we gave him a Doſe of *Tinctura ſacra*, and thirty Gutts of *liquid Laudanum*. About Midnight he purged a great deal, a conſiderable Share of which was indurated Stuff.

On the 15th we found the Opiate had procured him ſome Sleep. He had four Stools before we ſaw him in the Morning. The ſtrained and ſore Part of the Gut continued uneaſy, and his Fever ſtill pretty high; but his Belly was become quite ſoft. He continued to take Pills of *Soap* two Parts, and *Aloes* one, for ſome Hours. At laſt, after having been full ſix Days without one Grain of Food, he got every now and then two Spoonfuls of Chicken-broath, or one of *Panado*, and drank a little Sack-whey, or Cows Whey, till the Evening, when his Drink was changed to *Arabick* Emulſion, by turns with Barley-water ſweetned with Syrup of Violets. He paſſed a good Night without any Anodyne, and had three or four Motions preceeded by ſharp Gripes.

The 16th, in the Morning, he was leſs feveriſh,

feveriſh, and much eaſier. The ſame Food and Drinks were continued through the Day. He had two or three Stools with Gripes, which were ſucceeded by a good Night's Reſt.

In the Morning of the 17th he had one very copious Diſcharge, in which there were hard *Fæces* of the old Remains. After this he became quite eaſy, his Fever going off, as it does commonly the third Day after the Body is opened.

Before I give the Reaſons inducing me to propoſe, and the Gentleman to ſubmit to ſo uncommon a Practice, I ſhall tell what made me firſt think of it.

One who was no Phyſician, having read in a looſe Leaf of ſome old Book, that an obſtinate Conſtipation had been removed by throwing cold Water on the Feet, put it in Practice in *Holland* on an Acquaintance of his and mine, in a Caſe of that kind, which had proved obſtinate to all Dr. *Boerhaave*'s Applications for ſeveral Days. I was at ſome Pains in ſearch of the Author of this Hint, but could find nothing like it, ſave the Account that *Braſſavolus* gives, of *Savanarola*'s curing the Duke of *Ferrara* of a three Days Conſtipation; by making him walk bare-footed on a cold wet Marble Floor.

Though *Braſſavolus* counts this a dangerous

gerous Remedy, and not to be tried, becauſe it may bring on Gripes and a Flux; and however ridiculous the Experiment may at firſt Sight ſeem to be; I thought it ſo reaſonable, and conſonant to ſound Theory, that I ſtill kept it in my Eye, as well worth trying, when other Means of opening the Body failed; perhaps in the *Iliac Paſſion* itſelf. The *Rationale*, at leaſt the Feaſibleneſs of this Cure will, I hope, appear, from reflecting on theſe few looſe Hints, the Application of moſt of which is ſo obvious, that I ſhall hardly need to make it.

There is nothing more common than colick Pains and purging from cold wet Feet. *Cutis ſiccitas alvi laxitas*, is a well known Aphoriſm. On a ſudden Check of the Perſpiration, the perſpirable Matter frequently makes a Puſh at the Guts, and brings on a *Diarrhæa:* This ſeems to have an Advantage which neither Purgatives taken by the Mouth, nor Clyſters have, or can have; for either of theſe can act only on one End of the hard Excrement with which the Gut is in a Manner corked; whereas the Matter of the *Sanctorian Perſpiration*, check'd by external Cold, ruſhing into the Cavity of the Inteſtine, betwixt it and the *Fæces*, may, at once, lubricate the Paſſage, diſſolve Part of the hard Contents, and ſtimulate the Gut

to

to forward the Egeſtion. In the ſmall Pox, and other Fevers, when there has been a long Retention of Urine, Patients commonly get Relief immediately after ſetting their Feet on the cold Ground. As cooling the Feet forwards both the Secretion and Excretion of Urine, it may have a ſimilar Effect on the Bile. Moſt People incline to make Water, and many are diſpoſed to go to Stool, on putting their Feet into cold Water, or even waſhing their Hands with it; from a ſort of Tremor, Shock, or Stimulus induced on the Nerves; taking off ſome *Inertia* or Sluggiſhneſs of the membranous Syſtem of the Guts and Bladder, which had diſabled them from throwing off their Loads. From what I have obſerved, on opening the Bodies of ſome who have died of *Conſtipation*, and the *Ileus* itſelf, I am apt to believe, that frequently theſe Ailments are, firſt or laſt, owing to, or attended with, a kind of Palſey of the Inteſtines; to be cured by fomenting the *Abdomen* with Wine in which Aromaticks have been boiled, and drinking a little of the ſame when the Pulſe is ſlow and the Body cool; or in this Way by the cold Water, when the Patient inclines to be hot or feveriſh. By putting the Feet into cold Water, the whole Body is cooled; and the Blood, chilled by this

this Operation, occupying a leſs Space in the Coats of the Inteſtines, may allow of an eaſier Secretion into their Cavities: and if a conſiderable Quantity of Air in the Guts conduces to the Diſeaſe, by this Coldneſs it may be more condenſed; and the Inteſtine, hitherto ſtrained by its Rarefaction, now contracting, may be better able to perform its Office. The cold Bath is the beſt Cure of that Difficulty of making Water, which is cauſed by a too long Retention of Urine. Immerſion in cold Water was uſed by the Ancients in *ardent Fevers;* and it has been practiſed, even in this cold Climate, without any bad Conſequences; particularly by an hardy Empiric on his Mother, a Lady well ſtricken in Years, with notable Succeſs: So that there was leſs room for Objections to this Practice in the preſent Caſe, where the Patient was young and ſtrong, and the Fever ſymptomatick; eſpecially when the Diſeaſe ſeem'd deſperate without it.

I ſhall add nothing further, by way of Apology for this Method, and leave the Reader to chooſe for himſelf which of the Conjectures, thrown together in the preceeding Paragraph, to impute the Cure to: It may be owing to a Combination of ſome of them, or perhaps to others, which the Ingenious may think of, and I have omitted.

I might

I might add ſome Caſes a-kin to the one I have ſet down at large, in which the ſame Practice was attended with very good Effects, (ſuch as *eaſing Pain, giving Strength, carrying off the Sickneſs and vomiting*, &c.) even where it did not procure Paſſage immediately: But I ſhall content myſelf with ſubjoining a very extraordinary one; not on account of any Affinity betwixt the Diſeaſes, but becauſe the ſurpriſing Efficacy of this Application in opening the Body, appears in it. It was tranſmitted to me by my Friend Dr. *Pringle* Phyſician to the *Britiſh* Army, who had adviſed Mr. *Catherwood*, Surgeon to *Onſlow*'s Regiment, to make the Experiment. The following is a Copy of his Letter to the *Doctor*.

" One *Laurence*, a Soldier in Brigadier-
" General *Onſlow*'s Regiment, after a ſlight
" Intermittent, which was carried off by a
" Vomit and a few Bitters, was ſeized with
" an obſtinate *Conſtipation*, which laſted,
" in ſpite of all the Means I poſſibly could
" think of, from the 27th of *September* to
" the 8th of *November* following, before
" a Stool could be procured; which at laſt
" was obtained by the following Experi-
" ment. On the 8th of *November*, about
" Noon, a Clyſter of Water-gruel, with two
" Ounces of ſoft Soap, was firſt injected;

" in

" in a Quarter of an Hour after I ordered
" him to be taken out of Bed, ſtripp'd mid-
" thigh, and to be led about the Room by
" two of his Fellow-ſoldiers. At which
" Time I daſhed his Legs and Thighs eve-
" ry half Minute with cold Spring-water,
" which I found ſurpriſed him much, and
" ſeemed to give ſenſible Shocks to the
" whole Habit. About the tenth Minute
" from the firſt Sprinkling he began to drop
" ſome Excrement; at the 17th Minute a
" pretty tolerable Stool came away, rather
" a ſoft than a hard one; which ſurpriſed
" me the more, as he had been ſo long with-
" out one. Finding him at this Time weak,
" and fatigued with walking ſo much about,
" I ordered him to be wiped dry, put to
" Bed, and a Porringer of warm Broth to
" be given, and covered up cloſe. He
" continued in this Way till ten o' Clock
" at Night, at which Time he had another
" Stool, which was ſucceeded by two more
" involuntary ones before Morning; the
" whole making a pretty conſiderable Eva-
" cuation. It muſt be obſerved, that through
" the whole of this Caſe the Patient had no
" Complaint of Pain, no vomiting, but an
" extraordinary groſs Evacuation by Urine
" of a Chocolate Colour. Sometimes he
" would take his Nouriſhment pretty well,

" at

" at other Times obſtinately refuſe it. All
" along he ſeem'd to be ſtupid, and is at
" this Time ſo emaciated and weak, that,
" without ſome extraordinary Turn, I muſt
" think him ſtill incurable. If you can think
" of any thing that may be of further Ser-
" vice in this Caſe, I ſhall with Pleaſure ob-
" ſerve your Commands, being, *&c.*

Bruges, Nov. 11. 1742. W. CATHERWOOD.

N.B. *He is about* 45 *Years of Age.*

Before I conclude, I muſt beg the Reader to make Allowances for the Manner in which theſe haſty Thoughts have been thrown together; written at very different Times, and in different Tempers: One while, tho' diſſatisfied with the commonly received Doctrine, yet fluctuating and uncertain as to a better; at another Time, when the Arguments appeared ſtronger, eſpouſing as my own, what I had formerly ſeemed ſceptical about.

Studying Brevity, I have, no doubt, left ſome Parts obſcure; and more liable to Objections, than if they had been treated in a more diffuſe Way. Perhaps I ſhould have mentioned various kinds of *Fermentations* and *Putrefactions*, *cool* and *hot*; and particularly ſhewn an infinite Difference betwixt the Corruption of dead Bodies, or the rotting

ting of vegetable and animal Juices in open Air, and that *hot Putrefaction* betwixt which and the *animal Proceſs* I have traced a pretty near Analogy. Perhaps I have purſued the Analogy too far, and ſhould have ſet forth the many Circumſtances in which they differ. Indeed I could almoſt wiſh that, to avoid Cavil, I had inſiſted leſs on *Putrefaction*, and continued to call the *animal Proceſs* only an *effervescens ſui generis*; or begged of the Reader, as I did of the Gentlemen of the *Philoſophical Society*, when the firſt Draught of this Paper was read before them; that I might be indulged in deſigning this *Proceſs* by ſome unknown Term ſuch as *Z*; leaving to the Diſciples of *Newton* and *Homberg* to inveſtigate its Nature, and give it a proper Name.

I have kept back a good many Things that have a near Connexion with theſe Subjects; and alſo a Number of *Corollaries*, both *theorical* and *practical*, ſome of which ſeem to be of no ſmall Moment; they would have taken up too much Room in this Volume: Poſſibly they may appear in another Work; and perhaps with greater Advantage, after the Opinion of the *Publick* is known. Having endeavoured to lay together a few Materials for a *Phyſiology* more according to Nature, explode ſome Errors,

ſet

ſet ſome Practices on a better Foundation, and introduce ſomething new into Practice, as alſo thrown out ſome Conjectures for further Examination; I wait, with great Docility, the Judgment of the Learned, before I venture to infer from them all that I imagine may be drawn.

LXXVIII. *An Account of the moſt remarkable* Improvements *and* Diſcoveries *in Phyſick, made or propoſed ſince the Beginning of the Year* 1735.

DR. *Martin* (in one of his *phyſical and medical Eſſays*) has made uſeful Remarks on the Conſtruction and Graduation of Thermometers, and has reduced the moſt remarkable of theſe Inſtruments, which have been imployed in different Parts of *Europe*, for obſerving the Changes in our Atmoſphere, to one general Standard, ſo as to enable us to compare all theſe Obſervations together.

Mr. *Macky*, Profeſſor of Hiſtory in the Univerſity of *Edinburgh*, ſent the Royal Society a Voucher for the *Grandgor* (*Lues venerea*) raging at *Edinburgh* in 1497. It is a Royal Proclamation, ordering all who had the Diſeaſe, or who had attended People

under it, to repair forthwith to an Iſland in the *Firth of Forth*. *Philoſoph. Tranſact.* Num. 469. § V.

Dr. *Hahn*'s Treatiſe on the Antiquity of the Small Pox mentioned by us, *Vol.* 2. *p.* 383. has been criticiſed by Dr. *Werlhoff*, who endeavours to ſhew that Dr. *Hahn*'s Quotations from the old *Greek* Writers concerning the *Carbuncle*, cannot be underſtood of the *Small-pox*, which is a Diſeaſe we have no Account of, till the *Saracens* diſperſed it.

Dr. *Hahn* in a Letter on the *Cyrtonoſus*, or Rickets, which is commonly thought to be a modern Diſeaſe, quotes *Hippocrates* and ſeveral other ancient Writers, as treating of it.

Mr. *William Arrot* Surgeon, who lived a conſiderable Time in *Peru*, deſcribes the Tree from which the famous *Peruvian Bark* is got. It grows in the Country between two and five Degrees of South Latitude. It is tall, without Branches to near the Top, where it ſpreads out into a Hemiſphere. Its Bark is of a dark Colour on the out-ſide. Its Leaves reſemble thoſe of a Plum-tree. There are four ſorts of the *Bark*, the reddiſh, the yellowiſh, the curling, and the whitiſh. The two firſt are the beſt Kinds, the curled is got from young Trees,

and

and the white ſoon becomes inſipid. The beſt Sort grows about the City of *Loxa*. The *Indians* ſlice off the Bark from the Trees in the Woods, and it is immediately carried down to the Farm-houſes in the low Ground to be dried, *Philoſoph. Tranſact.* Num. 446. § 1. See alſo Mr. *Condamines* Account of this Tree in *Memoires de l'Acad. des ſciences* 1738, who ſays this Tree is called *Caſcarila*, and is very different from the *Quina Quina*.

The *Italian* Phyſicians ſeem at preſent very fond of *cold Water*, which they eſteem almoſt an univerſal Remedy, giving in the Day 15, 20, or 25 Pounds of Water made cold by Ice, and applying at the ſame time cold Water or Snow to ſeveral Parts of the Body. By this Method they treat Fevers, Small-pox, Dropſy, *&c. Commerc. Norimb.* 1736, *Hebd.* 8. § 2.

Near the famous Well at *Pyrmont* is a Stone Quarry under Ground, in ſome Parts of which a ſulphureous Steam comes out, which riſes a ſmall Height for ordinary. Animals held in this Steam are ſoon ſuffocated, but recover if quickly taken out. When one ſtands in this Steam, with the Head higher than it aſcends, it proves an excellent Sudorific. Dr. *Seip* propoſes to perform Cures in ſeveral Diſeaſes with it,

Philoſoph. Tranſact. Num. 448. § 4. and *Miſcellan. Berolinens*, Tom. 5. Part 2. § 4.

Mr. *Tennent* (in his Letter concerning the *Seneca Rattle-ſnake Root*) tells us, That being informed of the Efficacy of this *Polygala Virginiana, foliis oblongis, floribus in thyrſo candidis, radice Alexipharmaca*, in preventing the terrible Effects of the Bite of the *Rattle-ſnake*, and having ſeen People thus bit under Cure, by taking this Root internally, and applying it externally, he ſuſpected from the Analogy of the Symptoms with thoſe of a Pleuriſy, Peripneumony and other Diſeaſes ariſing from a Viſcidity and Coagulation of the Blood, that it might alſo be ſerviceable in thoſe Diſeaſes. Having afterwards made Trial of it in ſuch Caſes, it anſwered ſo well, that he gave it to a conſiderable Number of ſuch Patients, ſeveral of whoſe Caſes he relates.

This *Seneca Rattle-ſnake Root* has a faint Reſemblance to the Rattle of the Snake for whoſe Bite it was firſt employed by the Indians. Upon firſt ſwallowing the Powder of this Root, one does not think it very pungent, but ſoon after it diſcovers itſelf to be very acrid.

Mr. *Tennent* gives this Medicine either in Powder or Decoction, but prefers the Decoction

coction, having obſerved it to give Relief ſooner than the Powder does. The Doſe of the Powder is 35 Grains, and he gives at once three Spoonfuls of the Decoction, prepared by boiling three Ounces of bruiſed Root in a Quart (two Pounds) of Water, to near the Half. The Doſe is repeated every ſix Hours. Its Effects are diuretic, diaphoretic, cathartic, and ſometimes emetic; he prevents the two latter Operations, by mixing any teſtaceous Medicines with the Powder, and giving it in weak Cinamon Water.

When it is a genuine inflammatory *Pleuriſy*, he lets Blood in the Beginning, and repeats it afterwards, if there is occaſion. But if either the Diſeaſe is of the nervous or baſtard kind, or has been of ſome ſtanding, he forbears Blood-letting, Veſicatories, and all other Medicines, truſting entirely to *this Root*, which he affirms has ſcarce ever failed to make a Cure, and that in ſome very deſperate Circumſtances.

Mr. *Tennent* not only recommends the *Seneca Rattle-ſnake Root* in theſe more acute Diſeaſes, but is alſo fond of it in the Rheumatiſm, Dropſy and Gout, in which laſt Diſeaſe, he ſays, he has given it with Succeſs.

Meſſrs. *Lemery*, *Du Hamel* and *Du Juſſieu* vouch for the good Effects of the

Seneca Root in Pleuriſies and other inflammatory Diſeaſes. *Memoires de l'Acad. des Sciences* 1739.

Mr. *Du Hamel* found the *Polygala vulgaris* of Service in promoting Expectoration in Pleuriſies, *Memoires de l'Acad. des Sciences*, 1739.

Jo. Jac. Zannichelli, (in a Letter *de Hippocaſtani facultatibus*) affirms, that after a great many Trials, he has found the Bark of the *Hippocaſtanum* to have the ſame Effect as the *Peruvian Bark* has.

The Powder of *Cortices Aurantiorum* ſometimes cures quartan Agues. *Commerc. Norimb.* 1735, *Hebd.* 11. § 3.

Dr. *Kramer* recommends the Powder of the Root of the *Gratiola Centaurioides*, *C. B. Pin. Flore albo*, as having the Effect of *Ipecacuan* in Diarrhœæ and Dyſenteries. He alſo ſays it cures intermitting Fevers, and is preferable in Decoction to the *Woods*, in the Cure of the *Lues venerea*. *Commerc. Norimb.* 1738, *Hebd.* 3. §. 1.

Dr. *Flemyng* (in his *Propoſal for the Improvement of Medicine by Phyſicians propoſing whatever they think uſeful to be examined and canvaſſed by others*) propoſes a Query concerning giving the *Jeſuites Bark* in the *Small-pox*, and recommends the

the Practice, which, in his Preface, he ſays he is glad to ſee has been practiſed by Mr. *Monro*. See *Art.* X. *Vol.* V.

We have an Account of many fatal Conſequences from the prepoſterous Uſe of the *Peruvian Bark*. *Select. Medic. Francofurt. Tom.* I. *Vol.* 4. *Art.* 2. confirmed by particular Examples, *Ibid. Vol.* 6. § 2.

Dr. *Bruckner* recommends the Decoction of *Arnica vera* or *Plavienſis* in feveriſh Diſorders, accompanied with *Hemorrhagies*, *Efflorescentiæ*, &c. *Select. Medic. Francofurt. Tom.* I. *Vol.* 3. *Art.* 4.

The Powder of the Leaves of *Hedera arborea* is recommended by Dr. *Nebelius*, as a Specific which ſeldom fails to cure the *Paidatrophia*, or waſting of Children. The Doſe is as much as lies on the Points of two or three Knives, according to the Age, given in Tea or ſuch like Liquor, for nine Mornings, in the Decreaſe of the Moon. *Acta Medico-phyſic. Acad. naturæ curioſorum, Vol.* 5. *Obſ.* 120.

Mr. *Godfrey* affirms that moſt of what is commonly ſold for *Bole-armoniac*, *Terra Sigillata*, and *Terra Lemnia*, is *Pipe-clay* and *Oaker* grinded together, *Miſcellan. verè utilia*, *p.* 50.

The reſinous Part of *Opium* being noxious in Mr. *Godfrey*'s Opinion, he propoſes

to make *liquid Laudanum*, by digeſting an Ounce and a Quarter of *Opium* in half a Pint of diſtilled Water 24 Hours, ſhaking the Veſſel frequently, then filtres it, and adds three Ounces of Spirit of Wine, after which the other Ingredients may be added at pleaſure, *ibid. p.* 59.

Dr. *Wagner* (in his *clinical Obſervations*) recommends the Powder of *Squills* given with *Nitre* in hydropical Swellings and *Nephritis*, and mentions ſeveral Examples of Cures which he performed, by giving Patients four or ten Grains, with a double Quantity of *Nitre*. He ſays it almoſt always operates as a Diuretic, ſometimes vomits or purges.

Dr. *Heſs* ſays, he has made Cures of the *Aſthma* with the Powder of Squills *Commerc. Norimb.* 1737, *Hebd.* 14. § 2. & *Hebd.* 15. § 2. The Efficacy of this Powder of *Squills* from four to twelve Grains in curing the *Aſthma*, is atteſted by ſeveral, *Commerc. Norimb.* 1739, *Hebd.* 34.

Dr. *Trew* obſerving the Oil of *Cajeput* to reſemble the Smell of *Cardomoms*; and having procured ſome Cods, in which Grains were contained, from which an Oil reſembling that of *Cajeput* was got, he judges the Plant from which it is obtained to be the *Elegans Melegettæ ſpecies*, deſcribed by *Lobe-*

Lobelius, or the *Granis Paradysi sive Meligettæ affinis fructus*, *C. B. in Pin. Commerc. Norimb.* 1737. *Hebd.* 17. § 2.

Dr. *Trew* recommends four or five Drops of this Oil of *Cajeput* in a proper Liquor, as an excellent nervous Medicine, *Commerc. Norimb*, 1732, *Hebd.* 2. & *ibid.* 1737, *Hebd.* 24. § 2. and as of great Efficacy in the *Cardialgia*, *ibid.* 1734. *Hebd.* 5. § 1.

Dr. *Kramer* says *Pulv. Bufonum*, when applied by way of Pultice, with Barly-flower and Urine, is an excellent Remedy for ripening *Pestilential Buboes*, but that it has no such Effect in *venereal*, or any other than pestilential Buboes. *Commerc. Norimb.* 1735, *Heb.* 38. § 1.

A Viper-catcher allowed himself to be bit several Times by Vipers, which made his Arm swell, brought Pains in several Parts, caused him to vomit and purge, and occasioned several other bad Symptoms, which were all removed, by rubbing the Parts affected with *Sallad Oil*, over warm Coals. The *Sallad Oil* proved also a Cure to several Animals bit by Vipers, but others died, though it was applied, *Philos. Transact.* Num. 443. § 5. 6. Num. 444. § 7. Num 445. § 6.

Messrs. *Geoffry* and *Hunauld* being commissioned by the *Academy of Sciences*, to ex-

examine into the Virtue of *Oil of Olives*, in the Cure of the Bites of Vipers, conclude from a great many Experiments made on Fowls and Quadrupedes, and from ſome Hiſtories of Men bit by Vipers, that nothing can be affirmed for the ſpecifick Virtue of the *Oil* in this Caſe, for that ſeveral Animals recovered after they were bit by Vipers, to whom no Oil was applyed, and others died, for whom the Oil was employed according to the Directions of the *Engliſh* Viper-catchers, *Memoires de l'Acad. des Sciences*, 1737.

Drinking Sea-water, with ſome Wine, is ſaid to prevent People from being ſick at Sea, *Act. Phyſico-medic. Acad. natur. Curioſ. Vol. V. Obſ.* 84.

Mr. *Sutton* propoſes to clear Ships of foul Air by a Pipe, Branches of which are laid in the Hold, Well, and other, Places of the Ship, where there is ſtagnating Air, and its Extremity is fixed into the Aſh-hole of the Furnace, where the Kettle for preparing the Food is boiled; the Fire-hole and Aſh-hole being cloſe ſhut up by Iron-doors, as ſoon as the Fire is kindled, there muſt be a conſtant ſtrong Draught of the Air from the different Places where the Branches open. *Philoſ. Tranſact.* Num. 462. § 12. And Mr. *Watſon*, after mentioning the Advantages of

of this Invention ſhews how theſe Pipes may be laid ſo as to be noway inconvenient, and relates the Succeſs of a Trial of them that was made on a Hulk, *ibid*, Num. 463. § 4.

Dr. *Stephen Hales* (in his *Philoſophical Experiments*) ſhews how to have freſh wholſome Water from Sea-water, which had hitherto been attempted in vain. His Method is to keep Sea-water cloſe ſhut up, till it has putryfied, aud has again become ſweet, which all Water does; then he diſtills the Sea-water, and finds the diſtilled Water, when three fourths only of the Sea-Water are diſtilled, to be free both of the *Bittern* and *Acid*. He likewiſe enters into a particular Detail of the Stowage, Fewel, Diſtilling, quick Corruption and other Circumſtances which may make the Practice of this Supply of freſh Water more eaſy.

To preſerve Water from corrupting, he propoſes that two or three Drops of *Oil of Sulphur* ſhould be mixed with an *Engliſh* Quart of Water, which may be drank ſafely.

To preſerve Ship Biſcuit from Inſects, he adviſes to make the Fumes of burning Brimſton to paſs through the Casks full of Bread.

He propoſes alſo to ſalt the Fleſhes put a Ship-board, by injecting hydroſtatically a ſtrong Brine into the Blood-veſſels of Ani-

Animals immediately after they are killed.

Steel-waters often break the Bottles into which they are put, and many of them loſe their chalybeat Properties ſoon when bottled. To prevent the former Inconvenience, Dr. *Hales* put a ſmall Glaſs Tube thro' the Cork of the Bottles, filling them ſo as to leave no Air-bubbles between the Cork and Water. Into other Bottles he put ſome very ſoft compreſſible Corks. By both theſe means the Water was allowed to rarify, without burſting the Bottles.— By mixing very few Drops of an Acid, ſuch as *Ol. Sulphur. Sp.* or *Ol. Vitrioli*, with the Steel Waters, they retain long their chalybeat Property.— Dr. *Juryn* found the chalybeat Waters thus acidulated, to be a very ſucceſsful Remedy for a *Diabetes*.

Dr. *Hales*'s Amanuenſis has ſtrangely altered a Quotation which the Doctor makes, *p.* 147. from our *Vol.* III. *p.* 48.

Camphire is purified by diſſolving it in Spirit of Wine, and then diſtilling away the Spirit from it, the *Camphire* being afterwards melted in Glaſſes, is formed into Cakes of the Form of the Glaſſes. *Acta Acad. natur. Curioſ. Vol.* 5. *Obſ.* 98.

Dr. *Martin* (in one of his *Eſſays phyſical and medical*) endeavours to defend the Do-

Doctrine of the Ancients concerning the ſpecifick Operations of cathartic Medicines, againſt thoſe Moderns who alledge, that their Differences only depend on the greater or leſſer *Stimulus* which the ſeveral Kinds of Purgatives have: He does this from the different Nature of the Drugs, and by an Appeal to Experience.

Several Attempts have been made to diſcover the Compoſition of the Remedy which we mentioned (*Vol.* III. *p.* 391.) to have had a great Run at *London*.

The Author of one Pamphlet, (Ward's *Pill diſſected*) ſays, That if one of *Ward's* Pills, and one compounded of *Glaſs of Antimony* and *Cinabar of Antimony*, amaſſed with *Gum Tragacanth*, are put into different Places on a red hot Iron, you will ſee each of them emit a fine blue Flame with ſome Smoak, which laſts till the *Sulphur* and *Quickſilver* be both entirely conſumed, and there will remain upon the Iron in each Place the *Stibium* or *Glaſs of Antimony*, as plain and apparent as when it was firſt made, from which he concludes them to be the ſame Compoſition.

Mr. *Clutton* (in his *true and candid Relation of the good and bad Effects of* Ward's *Pill and Drop*) mentions ſome Caſes where they did Service, but relates the Hiſtories of

of fifty Caſes in which they did great Miſchief, and accuſes Mr. *Ward* of unfair Methods of obtaining falſe Teſtimonies of Cures performed by his Medicines.

From the Effects of theſe Medicines Mr. *Clutton* judged them to be compoſed of *Arſenick*, and ſome of the Violent Preparations of *Antimony*. To diſcover this, he diſſolved the ſeveral ſorts of *Ward*'s Pills, the blue, red, and purple in Water, and then viewing with a Microſcope the Powder which precipitated, he ſaw three different coloured Powders remaining of the blue Pill, to wit, a yellow, red and white Powder; the yellow and red agreed exactly with the *Glaſs of Antimony*, the white one appeared to be *common Arſenick*. Having put the waſhed Powder on a red-hot Bar of Iron, it melted, and then evaporated away, the Smoak of it ſtinking very offenſively of Leeks, giving him a ſudden Dryneſs in his Throat, as *Arſenick* does. *Ward*'s Pill being incloſed in Copper, and expoſed to a ſtrong Heat, made the Copper white, and as hard as Iron, which *Arſenick* alſo does. Leſt the white Powder ſhould be thought to be *ſublimate Mercury*, which alſo whitens Copper, he poured *Ol. Tartar per deliquium* on it; but it did not change its Colour; whereas *Ol. Tartar* makes *Sublimate* of a fine yellow

low Colour. Mr. *Clutton* alſo obſerved in this blue Pill another Powder, which by ſuch Experiments as have been mentioned, he judged to be *Zaffre*, that is *calcin'd Cobalt* incorporated with Flints.— As near as he could judge the Proportion of the ſeveral Ingredients in this blue Pill, are one third *Glaſs of Antimony*, near two thirds of *Arſenick*, and a very ſmall Part of *Cobalt* or *Zaffre*, with ſome Powder of *Blue*. All theſe kept together, with ſome Gum, are formed into Pills, of which ſome weigh 1 Grain and a half, others are leſs than half a Grain.

By like Experiments, the red Pill appeared to Mr. *Clutton* to be much the ſame Compoſition as the blue, only the *red Arſenick* was made uſe of inſtead of the *white*, and that the colouring of Powder *blue* was left out.

The Purple Pills tinged Glaſs blue when expoſed with it to a ſtrong Heat, which *Cobalt* or *Zaffre* does, therefore he thinks them compoſed principally of *Cobalt*, with a little *Glaſs of Antimony*, which left a yellowiſh Border round the blue upon the Glaſs.

Mr. *Geoffroy* relates the manner of making an Extract of Vegetables preferable to the common ones; it is by boiling a ſmall

Quan-

Quantity of the Drug in a large Quantity of Water, then evaporate the filtrated Decoction, to the Conſiſtence of a Syrup, which is to be poured into a Number of China-plates, where it is to be dried by the Heat of the Sun, or *Balnæum Mariæ*. The Cruſt ſcraped off the Plates, has the ſame Virtue as the Medicine, though reduced to one third its Quantity. *Memoires de l'Acad. des Sciences* 1738.

By mixing equal Quantities of the Juice of *Houſe-leek*, *Sedum minus*, paſſed through brown Paper, and of Spirit of Wine rectified by itſelf, a white *Coagulum* of a very volatile Nature is formed, which Dr. *Burghart* commends for curing Pimples of the Face, and ſays, that the thin Liquor ſeparated from it, with Sugar-candy, is an excellent Remedy for thick viſcid Phlegm in the Breaſt.— From the Juice of the *Sedum* coagulating with Spirit of Wine, he concludes the Juice to be of an alcaline Nature, the *Spirit of Urine* being the only other thing he knows that coagulates with Spirit of Wine, *Satyr. Sileſiac*, *Spec.* 4. *Obſ.* 2.

Mr. *Maud* Chymiſt, obſerved Cryſtals formed in the *Oil of Saſſafras*, as we mentioned, *Vol.* 4. *p.* 461. Mr. *Neuman* had done in the *Oil of Thyme*. *Philoſoph. Tranſact.* Num. 450. § 7.

Mr.

Mr. *Godfrey* (*Miſcellan. p.* 29.) affirms, that the Gin commonly ſold in *London*, is made by diſtilling 30 Gallons of Water, 10 Gallons of Lamp-ſpirits, and a Quart of Oil of Turpentine.

He obſerves, (*p.* 58.) That what is called *Mercurius vitæ*, prepared of *ſublimate Mercury* and *Antimony*, has no *Mercury* in it, but is the reguline Part of the *Antimony*, with the Acid of the *Sublimate*, and what remains is the *Mercury* formed into *Cinabar*, by the *Sulphur* of the *Antimony*.

Sal Ammoniac is now diſcovered to be no other than the Salt ſublimed from the Soot of burnt Cow-dung. *Memoires de l'Acad. des Sciences* 1735.

Mr. *Du. Hamel* obſerves that *Sal Ammoniac* mixt with the dry Powder of Chalk diſtils more eaſily, and yields a greater Quantity of volatile Salt, than by the common Methods. *Memoires de l'Acad. des Sciences*, 1735.

From the great Quantity of Sea-ſalt ſo frequently found in *Cineres Clavellati*, Dr. *Degner* ſuſpects that the Sea-ſalt is deſignedly mixed with theſe Aſhes, becauſe it is cheaper. *Act. Acad. N. C. Vol.* 5. *Obſ.* 150. See our *Vol.* 5. *Art.* 13.

It has been diſputed whether *white Vi-*

triol is any thing elſe than *green Vitriol* calcined, ſeeing *green Vitriol*, when calcined becomes white. Others obſerve that *white Vitriol* ſtrikes only a browniſh black Colour with Galls, and that though *green Vitriol* becomes white by Calcination, yet when it is diſſolved in Water, and again cryſtallized, it becomes green again, this Colour depending on the Water, which is no leſs than one third of its Compoſition: whereas the *white Vitriol* remains white after ſuch a Proceſs. Mr. *Lemery* ſhews that the Acid contained in the different *Vitriols* is the ſame, and that more or leſs of *Allum* enters into the Compoſition of both *green* and *white Vitriol*, but in a much larger Proportion in the *White* than in any of the *Green*, the *German green Vitriol* having much more *Allum* than the *Engliſh*.

Mr. *Lemery* ſhews a ſimple Method of reducing Steel to a very fine Powder, without ruſting it, as is done in the common Operations; it is this, Put Filings of Steel into an unglazed earthen Veſſel, pour Water into the Veſſel, till it is three or four Inches above the Filings, ſtir it well every Day, or every other Day, ſupplying more Water as that in the Veſſel ſubſides; ſo that the Steel is always covered; continue this Operation till the Steel falls into an impal-

pable

pable black Powder, then dry it for Uſe. *Memoires de l'Acad. des Sciences*, 1735, 1736.

Several remarkable Cures have been made in *Germany* by Dr. *Plummer*'s *alterant Medicine*, deſcribed in our *Vol.* I. *Art.* VI. *Acta Acad. natur. Curioſ. Vol.* 5. *Obſ.* 136.

The *Kermes Mineral* mentioned in our *Vol.* III. *p.* 390. was a Preparation of *Glauber*, which the King of *France* bought of Mr. *De la Ligerie*, and made publick in 1720; that Receipt was in the following Form. Take a Pound of *Hungarian Antimony*, broke into thin Pieces, according to the Direction of its *Spicula*, four Ounces of *Nitre* fixed by Charcoal, and a Pint of Rain-water. Boil them two Hours, then filtrate the warm Liquor, and when it cools, the *Kermes* precipitates. The ſame Antimony undergoes the ſame Operations with the remaining Liquor, to which three Ounces of *fixed Nitre*, and a Pint of Water is added. In a third boiling, two Ounces of *Nitre*, and a Pint of Water are to be added to the former Lixive. The *Kermes* thus obtained is about a Drachm, and is well edulcorated by waſhing it with Water, and burning Spirit of Wine on it, then it is dried for uſe.

Mr. *Geoffrey* shews by many Experiments, that the *Kermes* is the reguline Part of the *Antimony*, joined to a sort of *Hepar sulphuris*, and observes, that more *Regulus* is dissolved, and the Medicine is more emetic, by diminishing the Quantity of Water with which the *fixed Nitre* is diluted; he remarks too, That the more the reguline Particles are divided, the milder the *Kermes* is; and therefore he proposes to rectify the *Kermes*, by putting a Drachm of well made *Kermes* into a Matrass, with four Pints and a half of Water, adding two Drachms and a half of *fixed Nitre* purified, by being dissolved in Water, filtrated and then dried. He takes notice too, that the larger the Quantity of Materials are in this Preparation, they yield a proportional larger Quantity of *Kermes*, and by repeating the boiling, even without the Addition of more Nitre, a much greater Quantity of *Kermes* may be got.

He learns us a much easier way of preparing this Medicine than by the King's Receipt, which he says is practised by several Chymists. Mix intimately the fine Powder of two Parts of *Antimony* and one of *alcalized Nitre*, or of any other fixt alkali Salt, (for he observes as we did with Mr. *Lemery*, that any of them will serve as well as the

fixed

fixed Nitre.) Melt thoſe Materials in a Crucible, then having powder'd them while hot, boil them two Hours in a large Quantity of Water, after this, paſs the hot Liquor through brown Paper, receiving it into a Veſſel where there is hot Water, the *Kermes* ſeparates when it cools. The groſſer Parts which do not paſs through the Paper, are to be boiled again and filtrated as before for more *Kermes*; and the Operation is to be repeated a third Time, by which ſix or ſeven Drachms of *Kermes* may be got out of every Ounce of *Antimony*.

Mr. *Geoffroy* ſays, he has ſeen Effects very like to thoſe of mild *Kermes* from *Antimony*, reduced to ſuch a fine Powder, that none of the ſhining *Spicula* are to be ſeen. He likewiſe affirms that the *Magiſtery of Antimony* made by pouring *Sp.* of *Nitre* or *Aqua Regia* on the Powder of *Antimony*, and then edulcorating the Maſs with Water, has the ſame Effects as *Kermes*, three or four Grains of it vomiting, and one Grain acting as a Diaphoretic. *Memoires de l'Acad. des Sciences*, 1734, 1735.

Mr. *Groſs* diſſolving thin Plates of Lead in good *Sp. of Nitre* weakned with an equal Quantity of common Water, obſerved a grey coloured Powder precipitate, which when tried on Gold or Copper, ſhewed it-

ſelf to be mercurial, and even in the Powder he ſaw ſmall Drops of Quickſilver. *Memoires de l'Acad. des Sciences*, 1733.

We mentioned (*Vol.* III. *p.* 386.) Mr. *Boerhaave*'s Experiments on Mercury, communicated to the *Engliſh Royal Society*, he ſent an Account of the other Part of theſe Experiments to the *Academy of Sciences at Paris*. The Concluſions from theſe Experiments are, That he could not change Quickſilver into any other Metal, and that no Quick ſilver was to be got from Lead or Tin. *Memoires de l'Acad. des Sciences* 1734.

Mr. *Dicterícus* propoſes to *dulcify ſublimate Mercury* more effectually than is done by the common repeated Sublimations. His Method is to pour a large Quantity of boiling Water on it, two Pounds of Water to ten Ounces of Mercury, reduced to a very ſubtile Powder, after ſtirring them ſome time, he covers the Veſſels, and allows it to remain in reſt 12 Hours; then he pours off the Water, dries the Powder, and ſublimes it again in a Sand-heat. He ſays too, That Mercury may be had ſufficiently dulcify'd, by waſhing the *white Precipitate* with Water, till not the leaſt *Spicula* of Salts can be ſeen, and then ſublime it, *Commerc. Norimb.* 1737, *Hebd.* 29. § 2.

Mr. *Dicterícus* gives us theſe Rules for know-

knowing whether *ſublimate Mercury* is ſufficiently edulcorated in making *Mercurius dulcis*. If after rubbing the Mercury on Gold, the Gold becomes only pale, and not white, the Mercury is dulcified enough, or if *ſweet Mercury* becomes black when mixed with Lime-water, it is fit for uſe, but if either the Gold becomes white, or the Mercury is of a brown or yellow Colour, after mixing with Lime-water, it is not ſufficiently dulcified. *Commerc. Norimb.* 1735, *Hebd.* 1720.

Some inſtead of diſſolving *Quickſilver* in *Spirit of Nitre*, and evaporating to dryneſs, in order to make *corroſive ſublimate Mercury*, extinguiſh by Trituration Quickſilver in calcined Vitriol. Mr. *Lemery* obſerves, that *Bole-armoniac* or *Potters Clay* are cheaper, and extinguiſh the Mercury ſooner. He alſo agrees with *Barchuſen* and *Boulduc*, That the rubbing of *Salt of Tartar* on *corroſive Mercury* is no Trial whether it is ſophiſtcated or not, for both the Mercury that has the *Arſenic*, and that which wants it, becomes yellow, red, and at laſt black, when *Salt of Tartar* is rubbed on it. *Memoires de l'Acad. des Sciences*, 1734.

Dr. *Kirſten* affirms that ſublimate Mercury rightly prepared, becomes firſt Saffron-

coloured, and then red, when *Oil of Tartar* is drop'd on it; whereas if it is adulterated with *Arſenic*, it becomes firſt near the Colour of Brimſton, then red, afterwards aſhy-coloured, and at laſt black, when touched with *Oil of Tartar*. He is poſitive in this, notwithſtanding what *Barchuſen* and *Boulduc* have ſaid to the contrary. *Commerc. Norimb.* 1738, *Hebd.* 12. § 2.

An anonymous Chymiſt affirms that *Sublimate* prepared with *Arſenic*, becomes at laſt white, inſtead of black, when touched with *Oil of Tartar*. He ſays, that in the Sublimation of *ſweet Mercury*, where the *corroſive Sublimate* has been adulterated, the upper Part in the Operation is of a ſulphureous or Orange-colour, and a white Earth remains in the Bottom, and the Belly of the Glaſs becomes dark-coloured or ſmoaky; whereas, when the *corroſive Mercury* is genuine, the upper Part is white, the Powder in the Bottom is red, and the middle is not ſmoaky coloured. But the *ſweet Mercury* prepared with genuine or adulterated Corroſive, appear in every Trial the ſame. *Commerc. Norimb.* 1738. *Hebd.* 37. § 1.

Dr. *Kramer* relates the Hiſtory of a Lad who ſwallowed half an Ounce of *corroſive ſublimate Mercury*, ſoon after which his Mouth, Gullet and Stomach were ſo eroded, that

that he voided large Quantities of Blood both upwards and downwards, with violent Gripes, fainting, coldneſs of the Extremities, Convulſions, Cramps, ſtartings of the Tendons, and racking Pain. A Vomit was ſoon given, notwithſtanding which the Symptoms continuing, Dr. *Kramer* ordered mild Drink, with large Quantities of *Ol. Tartar per deliquium* in it, by which the Symptoms ſoon were mitigated, and the Cure was completed by giving *Theriaca Andromachi*, with *Terra Sigillata*, and putting him into the warm Bath. *Commerc. Norimb.* 1735. *Hebd.* 30. § 3.

The Analogy between the animal and Vegetable Kingdoms has been gradually ſhown within theſe hundred Years, but a much ſtronger Link of their Relation has been diſcovered lately than any one we knew before. Mr. *Lewenhoek* obſerved a ſmall aquatic Animal, from the Sides of which its Young germinated (*a*), and his Obſervation was confirmed by an *Engliſh* Gentleman (*b*). Mr. *Trembley* a young *Geneva* Gentleman having more accurately examined this Creature, which from its Number of ſmall Horns proceeding from its Head, he calls

(*a*) Philoſoph. Tranſact. Num 283.
(*b*) Ibid. Numb. 288.

calls *Polypus*, found that there were no Males and Females among theſe Creatures, but that each produced its Young, as Shoots come from Plants, only that at laſt they dropped away from the Parent.

Into how many ſoever Parts one of theſe Animals is tranſverſely cut, each Part becomes ſoon a complete Creature, the Head acquiring a Body and Tail, the Tail produces a Body, Head, and Horns, and from each intermediate Part both Head and Tail ſhoot out.—— When one of theſe Creatures is divided length-ways, each Half cloſes, and becomes again a complete Animal.—— When the Inſide of any one is turned out, it lives, feeds, generates, and does the ſame Offices as a ſound one does, ſo that the Outſide becomes Inſide, and the In-ſide changes into Outſide. Tho' this Creature conſiſts only of one Tube, yet its animal Nature is evident from its Motion, Senſation and greedy devouring its Food.

Mr. *Trembley*'s Obſervations and Experiments on this ſurpriſing Creature the *Polypus*, have been repeated and verified by ſeveral Gentlemen of the Royal Society at *London*, and Academy of Sciences at *Paris*, and ſome other Creatures of the Worm kind, *Urticæ Marinæ*, *Star-fiſh*, *&c.* have ſince been found to anſwer to ſeveral of theſe Trials.

Trials. See a full Account of this Affair in *Papers read before the Royal Society, publiſhed by Dr.* Mortimer, *Philoſ. Tranſact.* Num. 466. § 2. and 5. Num. 469. § 6. *Reaumur*'s Preface to his ſixth *Vol. of Hiſtory of Inſects.*

Mr. *Demour* (in his *Obſervation concernent l'hiſtoire naturelle*, tacked to his Tranſlation of our *Vol.* I. of *Eſſays*) affords us another Fact that ſerves alſo to ſhew the Relation of Animals and Vegetables; it is in the Copulation of *Water Salamanders*, the Male of which has no *Penis*, but ſquirts out the *Semen maſculinum* at a little diſtance from the Female; and though he could not obſerve that any of it is received into her Body, yet her *Ova* are fecundated.

The *French* Academicians have of late diſputed whether Monſters, that is, Creatures born with their Organs preternaturally formed or ſituated, ſupernumerary or defective, were originally ſo formed in their firſt *Stamina*, or whether this Deformity has been owing to ſome accidental Change upon them. The Arguments for theſe Opinions are Remarks on particular Hiſtories of ſuch Monſters which we cannot abridge, and therefore muſt refer to the *Memoires de l'Acad. des Sciences* 1733, 1734, 1738, 1739.

Dr.

Dr. *Barrere* (*Diſſert. on the phyſical Cauſe of the Colour of Negroes*) alledges that the Gall of Negroes is black, and being mixed with their Blood, is depoſited between their Skin and Scarf-skin.

Mr. *John Belchier* ſhewed to the Royal Society the Bones of Hogs, whoſe Bones were become red, by their feeding on Bran that had been boiled with printed Calicoes, which had been ſtained with Preparations of Iron, Alum and Sugar of Lead, and had had an Infuſion of *Madder-root*, *Rubia tinctorum*, to fix the Colours. *Philoſ. Tranſact.* Num. 442. § 8. By feeding a Cock 16 Days on Fig-duſt, with a little *Madder-root*, all his Bones became alſo red. *Ibid.* Num. 443. §. 2.

Mr. *Du Hamel du Monçau* has verified Mr. *Belchier*'s Experiments, and obſerved, that except the villous Coat of the Stomach and Inteſtines, the *Capſula* of the Cryſtaline and vitrous Humours of the Eyes, and ſome very hard bonny Tendons, and the Bones, no other Part had any Tincture of the *Madder*. The moſt ſolid Bones were moſt tinged, and all the red ones were larger, more ſpongy, and eaſily broken; nor did they unite ſo well when broken as white Bones. Some young Animals had their Bones tinged in three Days. The red Colour went gradu-

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ally off, when the Creatures forbore to take the *Madder* for Food, which proved unhealthy, for they began to languiſh ſoon and died with it.— Vegetables did not take the red Colour when they were planted in *Madder*; and none of the other Dyes which he fed Animals with, had any ſuch Effect of tinging their Bones as the *Madder* had. *Philoſ. Tranſact.* Num. 457. § 4. *Memoires de l' Acad. des Sciences*, 1739.

We are informed by a private Letter, that Mr. *Du Hamel* having mixed *Madder* with the Food of a Pig for ſome time, and then kept away the *Madder* as long Time, found upon ſawing the Bones through, that their interior *Laminæ* were red, while the exterior were white: And having fed another Pig ſix Weeks with *Madder*, then kept it out of its Food as long, and then mixed it other ſix Weeks; upon ſawing the Bones, they were compoſed of three Layers, the external and internal were red, the middle one was white.

Mr. *Hunauld* ſees frequently the Bones of the Heads of Children intimately united without any Suture, which he thinks muſt be of the worſt Conſequence. He demonſtrated a Nerve turning up from the ſemilunar Ganglion near the *meſenteric Plexus*, to be diſtributed to the right Auricle and

Baſe

Baſe of the Heart. He alſo ſhewed the lymphatic Veſſels of the Lungs, terminating in the thoracic Duct. *Hiſt. de l'Acad. des Sciences*, 1734.

Mr. *Du Vernoy* obſerves the right Side of the *Os Hyoides*, to be ſhorter than the left. *Comment. Acad. Petropolitan. Tom. 7.*

Dr. *Walther* has given a very minute Deſcription of the intercoſtal Nerves, and eight Pair, which we cannot abridge. *Nov. act. erudit. Lipſiæ* 1734 *Februar*, & *ibid.* 1736 *Septemb.*

Dr. *Wintringham jun.* (in his *Experimental Enquiry into ſome Parts of the animal Structure*) examines the Denſity, Thickneſs, and Force of the Coats of the larger Arteries and Veins, and the Properties of the Parts of the Eye.

1. To diſcover the Denſity of the Parts, he weighs them firſt in Air and then in Water, their ſpecific Gravities determining their Denſities.

2. To know their Thickneſs, he ſpreads them carefully on a ſmooth Surface, and then cutting off by an Inſtrument made for that Purpoſe, ſome determinate Portion, he let it down into Water; and as Bodies immerſed in this Fluid poſſeſs Spaces equal to themſelves in Bulk, by comparing their Bulks together, he found that a Quantity of Water

ter having the ſame Baſe, and equal to the ſolid Content of the Part immerſed, was of ſuch a preciſe Thickneſs equal to that of the Part before unknown.

3. To know the Strength of the Parts, he filled an Iron *Syphon* that had a free Communication with a *condenſing Machine*, with a ſufficient Quantity of *Mercury*. Into the *Syphon* he ſcrewed a *Glaſs Gage*, above double the Height of thoſe commonly uſed. He then firmly fixed the Part, the Strength of which was to be tried, to a Tube iſſuing out of the *Syphon*, and forcing in Air, he obſerved how high the *Mercury* roſe in the *Gage*, before the Part, on which the Experiment was made, burſted. By comparing the *Area* of the Part with the Height of the Mercury he found the Force required to burſt the Part of the Animal expoſed to ſuch a Preſſure.

By Trials made on the correſponding Arteries and Veins of the ſame and of different Animals, he found that the Coats of Veins are about $\frac{1}{19}$ more denſe than the Coats of the Arteries.— That the Denſity and Thickneſs of the Veſſels is greater in Males than in Female;-- That both Denſity and Thickneſs increaſe by Age, but more remarkably in the Arteries, and conſequently that the Coats then bear a greater Proportion to the Diameters

meters of the Veſſels than in young Animals. That the Strength of Veſſels is in a *compound Ratio* of the Denſity and Thickneſs of their Coats; That the Coats of Arteries are not of the ſame thickneſs in the whole Circumference of the Canal; but wherever there is a Curvature, the convex Side is thicker than the concave. That the Coats of the Branches of Arteries are ſo far from becoming weaker proportionally to their becoming thinner, that on the contrary they are ſtronger. That this greater Strength is proportionally greater in ſome Parts than in others, according to the different Purpoſes that are to be ſerved; ſo that it is impoſſible to ſettle any general Rule of Secretion, *&c.* from an uniform Texture of the Veſſels. That the Capacity of the Arteries in Females, is greater in reſpect of the Veins, than it is in Males. That the proportional Thickneſs of the Coats of different Arteries of the ſame Animal, is very various. That the *Vena portæ* is much ſtronger proportionally to its Contents than the *Aorta* or *Vena cava* is to its Capacity. That the Veins of ſecerning Organs are larger, and have weaker Coats than the Veins returning from other Parts.

By like Experiments it appears that the *Pericardium* nay even the *Pia mater* is much

much ſtronger proportionally to its Thickneſs than the *Aorta* is.

The Denſity of an entire *cryſtalline Lens* ſeparated from its *Capſula*, was to Water as 1106 to 1000. When the exterior thinner Part of the *Cryſtalline* was taken away, what remained was to Water as 1148 to 1000. The *Capſula* of the *cryſtalline Humours* were to Water as 1046 to 1000, nearly the ſame as the *Cornea*. The vitrous Humour was as 10024 to 10000. The Strength of the *Cornea* is to that of the *Capſula* of the *Cryſtalline* as 7129 to 1000. By weighing Lead in Water, and in the vitrous Humour, he found the Coheſion of the Parts of the vitrous Humour to be to that of Water as 45 to 1. In an Ox's Eye, the *Cornea* was $\frac{1}{20}$, the *Capſula* of the *Cryſtaline* $\frac{1}{488}$, and the *Retina* $\frac{1}{1571}$ of an Inch in Thickneſs. By placing an Ox's Eye on a horizontal Board, and applying moveable Silk Threads kept extended by ſmall Plummets, ſo as to be exact Tangents to the Arch of the *Cornea*, as well at each *Canthus*, as at the *Vertex*, he found that the *Chord* of the *Cornea* was equal to 1.05 of an Inch. The *verſed Sine* of this *Chord* was 0.29. Then taking away the *Cornea*, he found the Diſtance of the anterior Part of the *Cryſtalline* from the *Vertex* of the *Cornea* to be 0.355

of an Inch. By the like Trial he found the *Chord* of the *Cryſtalline* 0.74, and the *verſed Sine* of its anterior Surface, 0.189, and the *verſed Sine* of the poſterior Surface 0.266 of an Inch. The *Axis* of the *Cryſtalline* was 0.575, and the *Axis* of the whole Eye, was 2.21 of an Inch. The *vitrous Humour* did not yield to the greateſt Force which he could apply of the condenſing Engine.

By applying Weights to Threads placed as a Sphincter on the Edge of the *Cornea*, he found it required three Ounces two Penny Weight and nine Grains to make the *Vertex* of the *Cornea* advance $\frac{1}{20}$ of an Inch.

By putting a long ſmall Needle between the Edge of the *Uvea*, and the ciliary Circle, he found it required 19 Penny Weight, ſometimes more than an Ounce, to ſeparate the *Iris* from the ciliary Circle; and therefore the *Iris*, the Circumference of which was equal to 3 $\frac{3}{4}$ Inches, might exert a Force equal to nine Ounces ten Penny Weight at leaſt, before it would ſeparate from the ciliary Circle; conſequently it could raiſe the *Cornea* into a greater Sphericity.

We are too much confined by our Plan to mention here all the Conſequences Dr. *Wintringham* draws from theſe Facts; we

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ſhall however give a Specimen of them.

If Arteries had been as denſe as Veins, they would have oſſified by the Preſſure they undergo; and on the ſame Account the *Aorta* is not ſo denſe as its Branches.

Bleeding is neceſſary in old as well as in young People, but muſt not be ſo plentiful in the former.

Nouriſhment of old People ſhould be leſs than of young.

Diſeaſes are from Laxity in Females from Rigidity in Males.

The *mutable Focus* of the Eye does not depend on any Motion of the *cryſtalline Humour*, nor on the Condenſation of the *vitrous Humour*, but on the Change of the Figure of the *cryſtalline* and *Cornea*, by Means of the *Iris* and *Ligamentum Ciliare*.

Dr. *Stuart* (in his *Treatiſe on muſcular Motion*) having propoſed the Arguments for a Fluid of the Nerves taken from the Analogy of the Brain to other Glands, and from what we mentioned (*Vol.* II. *p.* 387.) and having ſhewn, by the Experiments there taken Notice of, the great Elaſticity of the Blood-veſſels, while the Nerves have none, he tells us, what Idea he has of a *muſcular Fibre*, to wit, that it is a nervous Filament formed into ſmall Veſicles, covered with a

Net-work of ſmall Blood-veſſels. He quotes Dr. *Hook* affirming that he ſaw the Fibres of the Muſcles of Fiſhes, like ſo many Onions or Pearls fixed to one another, with a Thread through them; and *Lewenhoek* acknowledging he once ſaw ſomething like to this; which, with the Analogy and ſimilar Appearances of the large hollow contractile *Viſcera*, the Heart, Lungs, Inteſtines and Bladder, he thinks make a probable Proof of ſuch a Structure in Muſcles.

Suppoſing then, with the Doctor, the muſcular Veſicles contracted to the greateſt Degree, their reticulated Veſſels muſt be ſo convoluted and ſtraitned that no Fluid can paſs through them. But when the Fluid of the Nerves diſtends the Veſicles, the Veſſels will admit Blood, and will be brought nearer to ſtraight Lines, by which they aſſiſt in raiſing the Sides of the Veſicles, to receive more nervous Fluid, the Force of which on the Sides of the Veſicles increaſes proportionally to the Increaſe of the Veſicles, as we ſee in the *Water-bellows*. When the Veſicles approach to a ſpherical Form, the elaſtick reticular Veſſels exert their elaſtick Power, endeavouring to bring themſelves to ſtraight Lines, which can only be done by contracting each Veſicle in all its Dimenſions, which is the proper *Action*, *Syſtole* or *Contraction*

traction of a Muſcle, by which the nervous Fluid is drove forward out of the Veſicles a the proper Outlet of the tendinous Fibres to be carried to the *Perioſteum*, from whence it is returned in the common Courſe of Circulation.

That it may not be ſaid that the nervous Fluid diſtending the Veſicles would prevent the elaſtick Contraction of the Veſſels, Dr. *Stuart* takes Notice that Muſcles which have not Antagoniſts, or thoſe whoſe Antagoniſts are cut aſunder, remain conſtantly contracted; ſo that the nervous Fluid even impelled with the utmoſt Effort of the Mind, is not capable of diſtending the Veſicles, which would remain always contracted, if it was not the ſtretching Power of the Antagoniſts, but when there is an *Æquilibrium* between them, any Addition to either of them muſt make that one prevail.

The Muſcles appointed for the natural and vital Functions which have not antagoniſt Muſcles, remain in a conſtant contracted State, till a Power ſuperior to the Elaſticity of the Veſſels diſtends the Veſicles, by which the Vigour of the Spring of thoſe Veſſels is reſtored; thus the *Sphincters* of the *Anus* and *Bladder* retain the *Fæces* and *Urine*, till the powerful abdominal Muſcles and Diaphragm are employed to overcome their

Contraction.— The Heart and Lungs have Fluids flowing into their Cavities to ſtretch them, and the Sides of theſe Cavities recoil again upon their Contents to expel them.--- The Stomach and Inteſtines have the Food and expanſile Air acting irregularly on them, and ſo occaſioning their Contraction in an uncertain Way.

The Muſcles of voluntary Motion have all Antagoniſts, which keep them *in æquilibrio*, till the Mind directs more nervous Fluid into one than another. The Veſicles that are diſtended with this Fluid, receive more Blood into their reticular Veſſels, while the Veſſels of the Antagoniſt Muſcle receive leſs, becauſe of their larger Veſſels coming from the ſame common Trunk. After the Veſſels of the Muſcle, which the Mind thus influences, are brought to their extended State, they exert their ſtrong Power of Elaſticity, and come to their contracted State, when the lengthned Muſcle prevails and ſhortens itſelf, till the Power of both is brought to an *Æquilibrium* again.

From this Doctrine the Doctor accounts for Muſcles being harder, paler, and of leſs Volume when ſtretched, but eſpecially when fully contracted; and illuſtrates this by Obſervations on the Motion of the Guts of a living Rabbit, parts of which were diſtend-

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ed with Air confined by a strong Contraction of the muscular Fibres above and below the distended Part; for the distended Part had its Vessels full, while the contracted Parts were pale. By his Doctrine too he explains Dr. *Glisson*'s Experiments of immersing the Arm into a Vessel full of Water, which subsides rather than rises, when the Muscles contract violently.

There are a great many Glands in the Body, which have no particular excretory Ducts, Dr. *Quietschius* would have these called *Glandulæ cæsæ* or *clausæ*. Instead of being *lymphatic*, which is the common Opinion, he argues for their being designed to prepare Nourishment to the other Parts, and particularly for the *Glandulæ apertæ*. What he chiefly founds his Opinion on is, observing the *Glandulæ cæcæ* decreasing after Birth to full Growth, then continuing in nearly the same Condition, till old Age comes on, after which they gradually shrivel. For, says he, the great Increase of the Body in Childhood exhausts them; in middle Age the Waste and Supply is near equal; in old Age the Liquors are no more supplied, and these Glands decay, the open Glands keeping up, till the shut ones are entirely exhausted, after which the open Glands waste too. *Select. Medica Francofurtens. Tom.* 2. *Vol.* 1. § 3. Dr.

Dr. *Chevalier* defends (in a *Thesis*) *Fracassatus*'s Opinion of the Motion of the Brain being owing to the Air entring by the Olfactory Nerves into the Ventricules of the Brain, which Air, rarified by the Heat, loses its Spring, and is expelled by the elastick contracting *Dura Mater*.

Mr. *Le Cat* (in the *preliminary Discourses to his Physiology*) explains his Notions of our Solids and Fluids, among which there are several uncommon, we shall mention one or two. A *Caustick Fluid* is according to him what detains the Blood in a fluid State, and forms the red Globules; but this needs the Assistance of the *animal Fluid*, which is the Principle that preserves all from Corruption, and to it we owe our Sensation and Motion. This *animal Fluid* passes in the proper nervous Tubes to the Organs of Motion, but is contained in the fibrous Coats of the Nerves to become an Organ of Sensation. This *sensitive Fluid* is, he says, capable of thinking, and is so modified by the *Ganglions*, that what is lodged in each Part, is capable of being impressed by the Object proper to each Organ. From this Doctrine concerning this *animal Fluid*, he endeavours to account for most Operations which are generally said to depend on the Soul.

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In his Treatiſe on the Organ of Sound he has ſome new Figures of ſome Parts of the Ear, and propoſes an Inſtrument as of his own Invention to aſſiſt dull hearing, it conſiſts of a Shell or Cornet of Copper into which a ſmall Funnel-like Tube is fixed, ſo as its narrow End is at the Center of the Cornet. Dr. *Parſons Philoſ. Tranſ.* Num. 466. § 9. ſays this Inſtrument is common in *England.*

The Picture which Mr. *Le Cat* gives of the Baſe of the Brain, with the ſeveral Nerves and Veſſels, is new and elegant.

In his Deſcription of the Parts of the Eye, he ſays the *Pia Mater* gives three Membranes to the Eye; the firſt lines the *ſclerotic Coat*, and is joined to it, the ſecond is the *choroid Coat*, and the third is the *villous mammary* one, proceeding from the *Choroid*, and is commonly called *Ruyſch*'s Coat.

He ſtrenuouſly defends Mr. *Marriot*'s Opinion of the *choroid Coat*, and not the *Retina* being the immediate Organ of Viſion, the *Retina* according to him is to the *Choroid* what the *Epidermis* is to the Skin.

The Figure he gives of the *lacrimal Gland* and *Ducts* is new, repreſenting the Parts in their natural Poſture.

In his Doctrine of Light and Colours, he differs in ſome things from Sir *Iſaac Newton*;

ton; but our Deſign will not allow us to follow our Author in his Account of this Subject, and the Explication which he gives of the *Phænomena* of Viſion.

Morgagni has at laſt performed his Promiſe, (*See our Vol.* II. *p.* 371.) he has publiſhed a new Edition of *Valſalva*'s Treatiſe *de aure humana*, and to that he has joined the poſthumous Diſſertations, both making a Volume in *4to*. He has accompanied theſe with eighteen Letters of his own, which make two Volumes in *4to*.

Morgagni's Remarks on the Ear, Heart with its Veſſels, Nerves, Inteſtines, Eyes, and *Glandulæ renales* are made with the Accuracy ſo conſpicuous in all that great Anatomiſt's Writings. An hiſtorical Account is generally premiſed of what has been ſaid on each Part of the Subject he treats of, and then he relates *Valſalva*'s and his own Deſcriptions and Obſervations made in a Variety of Animals, but particularly on the human Body. The Number and Variety of theſe Remarks conſiſting chiefly of accurate minute Deſcriptions, makes it impoſſible for us to enter upon a Detail of them in the narrow Compaſs to which we are confined.

Dr. *Caſſebhom*'s Treatiſes on the *Ear*, being only minute Deſcriptions of Parts, we cannot abridge him, and muſt therefore refer to his Book.

Dr.

Dr. *Vaterus* is of Opinion that the Tears come from the white Lines ſeen on the Inſide of the *Palpebræ*, deſcribed by *Meibomius*. He obſerved two ſmall Ducts beſides the common naſal Duct from the *lacrymal Sac* into the Noſe; one of them opened into the upper Part of the Noſe, the other opened into the *antrum maxillare*. *Miſcellan Berolin. Tom.* 4. *Pars* 3. § 5.

Mr. *Ferren* demonſtrated to the *Academy of Sciences* at *Paris*, the lymphatic Veſſels of the *Uvea* of the human Eye. *Hiſtoire de l'Acad. des Sciences*, 1738.

Mr. *Weitbrecht* gives an accurate Deſcription and Picture of the *frontal*, *occipital*, *palpebral* and *facial* Muſcles, which is too long to tranſcribe, and cannot be abridged. See *Comment. Acad. Petropolit. Tom.* 7.

The Tongue is generally eſteemed a neceſſary Organ in ſwallowing and taſting, yet a Woman who loſt her Tongue entirely by a Cancer when four Years old, ſpeaks diſtinctly, ſings prettily, ſwallows eaſily, and taſtes accurately. *Philoſ. Tranſact.* Num. 464. § 11.

Mr. *Petit* the Surgeon endeavours to prove, that, in ſucking, Children principally force down the Milk from the Breaſt by the Preſſure of their Lips and Tongue making a little Void at the End of the Nipple,

to

to aſſiſt the Flow of the Milk each time they ſwallow. *Memoires de l'Acad. des Sciences*, 1735.

Mr. *Weitbrecht* concludes, from the ſmall Quantity of Blood thrown out of the Heart into the Arteries, and the great Reſiſtance in the capillary Arteries, that all or much the larger Share of what is ſent out of the Heart, is retained in the Arteries during the *Syſtole* of the Heart, and is ſent forward into the Veins, by the Contraction of the Arteries, but ſo that the Veins can have no Pulſation, becauſe as much as is received from the Veins is thrown into the Heart at the ſame Time. The ſmallneſs of the Quantity of Blood thrown out of the Heart, makes him think that the Pulſation of the Arteries cannot be ſo much owing to their Diſtenſion as to their Change of Place, and he ſays, he perceives upon Trial that all the Arteries of the Body are not dilated nor contracted at the ſame time.

He likewiſe argues that the Weight of the Blood contributes nothing to its Motion, becauſe the Arteries and Veins are to be looked upon as *Syphons*, where the Blood in the two Legs muſt be *in æquilibrio*; nor can the greater Length of the arterious Leg, according to him, have any remarkable Effect in the Circulation, otherwiſe we ſhould be much

much diſordered in lying horizontally.

Mr. *Weitbrecht* allows the Attraction in the ſmall capillary Veſſels to be the ſame as in any other ſuch Tubes, but ſeeing *that* is always confined to a determined Extent, and cannot exert its Power in larger Veſſels, he does not think this Attraction is what carries the Blood into the Veins.

The *Auricles*, according to our Author, ſerve to give an *impetus* to the Blood on the *Ventricles* of the Heart; for the Blood moves ſo ſlow in the Veins, that its *Momentum* would not be ſufficient to diſtend, and to give a great enough Spring to the Ventricles. The pulmonary Blood acquiring conſiderable Velocity by the Motion of the Lungs, requires a much leſs Auricle than the Blood of the *Venæ cavæ*. *Comment. Acad. Petropolit. Tom.* 6. & 7.

From the Experiments made on living Animals by Dr. *Houſton* (*a*), Dr. *Hoadley* (*b*) and Mr. *Bremond* (*c*) the Lungs ſeem to act independent of the *Thorax*, continuing to be dilated and contracted after they are expoſed to the Air. We regrete that a Detail of theſe Experiments would take too much Space to be inſerted here, and that on this account we are obliged to refer to (*a*) *Philoſoph. Tranſact.* Num. 441. § 4. (*b*) *Lectures*

ctures on Reſpiration (c) *Memoires de l'Acad. des Sciences*, 1739.

Dr. *Hoadly* (in his *Lectures on Reſpiration*) endeavours to prove that the *external intercoſtal* Muſcles ſerve for Inſpiration, while the *internal Intercoſtals* are their Antagoniſts, depreſſing the Ribs in Expiration. Upon conſidering the Directions of the Fibres of theſe Muſcles, and the Motion of ſeveral Ribs, the Antagoniſm of the Muſcles muſt, he thinks, appear evident; for the Fibres of the *internal* intercoſtal Muſcle muſt be lengthned when the Ribs are raiſed, whereas, ſays he, all contracting Muſcles are ſhortned. Several Authors have been of his Opinion, and Mr. *Bayle* of *Tholouſe* mentions a Demonſtration for it.

He thinks it proved by Dr. *Hales*'s Experiments (*Vegetable Staticks*, Exp. 112. and 113. and *Hæmaſt. p.* 83.) that there is Air in the Cavity of the *Thorax* between the Lungs and the *Pleura*, and endeavours to take off the Force of Dr. *Houſton*'s aſſerting that he ſaw the Lungs and *Pleura* contiguous. He grants however that ſometimes there may be little or no Air. He accounts for Reſpiration nearly in the ſame way with thoſe who aſſume the Contiguity of the Lungs and *Pleura*.

He joins with thoſe who think the *Impetus*

petus which the internal Surface of the Lungs ſuſtains in common Reſpiration to be very little, ſuch, to wit, as would be equal to a Column of Water (whoſe Baſe is the internal Surface of the Lungs, and whoſe Height is but $\frac{1}{70000}$ Part of an Inch) moving with a Velocity no greater than what would carry it through an Inch in a Second of Time.

According to our Author, the Uſes of Reſpiration are to diſcharge from the venal Blood and Chyle ſuch Parts as are unfit to render them arterial Blood, and to admit Air into the Blood.

From this Doctrine, he endeavours to account for the *Phænomena* of the Diſeaſes of the Lungs.

He ſubjoins the Picture and Deſcription of a very ingenious Inſtrument he has contrived for illuſtrating the Manner in which he thinks Reſpiration is performed.

Mr. *Petit* the Phyſician, examining the Body of a Child that had lived few Hours after Birth, ſaw the Lungs of the Right Side ſuch as is common to thoſe who have breathed; but thoſe of the Left-Side, were as of a *Fætus*, and ſunk in Water, which was owing to the *Trachea* being blocked up with a thick glairy Matter; whereas all the *Mucus* in the *Trachea* of a *Fætus* is not above 14 or 16 Grains, which does no more than be-

smear the Surface of the Lungs when the Air rushes in.—Mr. *Petit* says, That when once the Lungs are blown up, the Air cannot be pressed out with the Fingers, but may be exhausted, by keeping the Lungs in the exhausted Receiver of an Air-pump.— He observes that there is generally more Liquor in the Thorax of *Fætuses*, than of Animals which have breathed. To know if this Liquor came from the Cavity of the Lungs, he poured Water into the *Trachea*, but none of it passed through the Membranes of the Lungs, he seems inclined to believe that this Liquor in the *Thorax* of *Fætuses* is furnished by the *Thymus*. *Memoires de l'Acad. des Sciences*, 1733.

Dr. *Boesel* relates an Example of a Child certainly born dead, whose Body was not dissected till it was considerably putrified, its Vessels were full of Air, and Vesicles distended with it were seen on the Lungs, which swim'd in Water, unless when a little Piece of their internal Substance free from all Bubbles of Air was cut out; such a Piece thrown into Water sunk to the Bottom of the Vessel. *Commerc. Norimb. ann.* 1736. *Hebd.* 1. § 2. How cautious ought they to be who examine the Bodies of Infants, in order to make a judicial Report?

Mr. *Ferren* observes that each Lobule of the

the Liver conſiſts of an external friable yellowiſh-red *cortical* Subſtance, and of an internal ſoft, pulpous, *medullary* Part, placed in the Centre of each Lobule. He is of Opinion that the medullary Subſtance is the pulpy Extremities of the bilary Ducts, proceeding from the cortical Part.

According to him, the Blood in the hepatic Artery has Bile ſecreted from it, and its remaining Blood is conveyed by Veins into the *Vena portarum*, where a ſecond Secretion is made from it. Beſides the Secretion of Bile made from the hepatick Artery and *Vena portarum*, our Author ſays, he has ſeen bilary Ducts coming from the left Ligament of the Liver, from the Diaphragm, Coats of the Gall-bladder, and Part of the *Vena cava*, all which he affirms may be ſeen, by injecting coloured Liquors into the Trunks of the hepatic Ducts.

In Mr. *Ferren*'s Opinion the Bile is equally bitter and ſtrong in the ſmalleſt bilary Canals, as in the larger Trunks; the thick yellow Bile ſometimes found in the Trunks being the *cyſtic* Bile, remounting from the *Ductus communis cholidochus* into the *hepatic* Duct, on which Account the hepatic Duct is often of a larger Diameter than the common bilary Duct.

He mentions how to trace the lympha-

tic Vessels to the extreme Branches of the *Vena portarum*, and to the bilary Ducts, by injecting Liquors into the larger Trunks of the external Lymphatics.

The lymphatic Vessels of the Kidnies appear, he says, upon blowing Air by the *Ureter* into the *Pelvis* of the Kidney. *Histoir. de de l'Acad. des Sciences*, 1733.

Mr. *Lieutaud* argues for the *Spleen*'s being larger by a greater Quantity of Blood in it, when the Stomach is empty, and that this Blood is pressed out when the Stomach is full, to increase the Secretion of Bile. *Hist. de l'Acad. des Sciences*, 1738.

Mr. *Du Vernoy* remarks the *Glandulæ renales* to be very variable in their Magnitude, Figure, *&c.* but that they are always contiguous, and firmly connected to the Kidnies. In some *Fætuses* they appear solid, without any Cavity, in others they are distended with thin Blood. In Adults they are always flat. They are readily distended, by blowing Air into them by their Vein. When the Glands are opened, and Quicksilver is injected, a great many Ducts are seen at which the Mercury runs out. Two Arteries and a Vein belong to each Gland, and a great many Ducts disposed like Rays, *radiorum forma*, make a Circle round it. An Artery rising from the *Aorta* is sent down

from

from the lower Edge of the *Gland* to the *Testes* of Men, and *Ovaria* of Women, which he thinks *Valsalva* mistook for Ducts. *Comment. Acad. Petropolit.* Tom. V.

Mr. *Weitbrecht* gives a better Description of the Figure and Situation of the human Bladder, than in the common anatomical Systems. *Ibid.*

Dr. *Agricola* describes a Valve at the Entry of the *Canalis arteriosus* into the *Aorta descendens*, composed of four Sides, two of which, he says, prevent its being shut till after Birth, and the other two prevent its being thrust off from the Orifice of the *Canalis arteriosus*. *Commerc. Norimb.* 1735, *Hebd.* 4. § 2.

Dr. *Trew* endeavours to shew, how, after Birth the *umbilical Vein* and *Arteries*, separating from the Navel, gradually retract within their *Sheaths*, which they have from the *Peritoneum*, and how the Sides of the *Sheaths* grow together, as the Sides of the Remains of the Vessels also do; so that the Hæmorrhagies which sometimes happen at the Navels of Adults, must not be from the umbilical Vessels, but from some other. *Commerc. Norimb.* 1737. *Hebd.* 13. § 1,

Dr. *Stack* informs us of a Woman, aged 68 Years, who gave Suck to two Grandchildren; the first brought Milk into her Breasts,

by ſucking when ſhe put her Nipple into its Mouth, to quiet it in Abſence of her Daughter, its Mother. *Philoſoph. Tranſact.* Num. 453 § 10.

Dr. *Martin* (*Tract. de ſimilib. animalib.*) treats of the Laws and Proportions of the Motions and Forces of the Solids and Fluids of Animals, of however different Magnitudes, which are ſuppoſed of ſimilar Make and Conſtitution, but in a Manner that makes it impoſſible for us to abridge his numerous *Propoſitions*, *Scholia* and *Corollaries* in ſuch ſmall Compaſs, as we are confined to.

The Editor of *Boerhaave*'s *Phyſiologia*, with the Figures of the Parts copied from the Books, which *Boerhaave* cites, ſays very juſtly, that the Pictures ſerve to make the Text be better underſtood, and may ſave the Trouble of conſulting a great Number of Books.

Dr. *Haller* (in *Boerhaave's Prælect. Acad. in proprias Inſtitut. cum notis*) has not only collected from the beſt Authors, what relates to the animal Oeconomy, but has corrected and improved them in a great many Particulars.

Mr. *Le Cat.* has contrived a Hammock of *Turky* Leather, which may be eaſily raiſed or let down with a ſick Perſon in it, by Ropes

Ropes and Pullies. *Philoſoph. Tranſact.* Numb. 468 § 8.

In our *Vol.* IV. *p.* 483. we mentioned Mr. *Petit*'s Opinion of Hæmorrhagies from cut Arteries being ſtopped by a Plug of clotted Blood, he has ſince ſhewn to the *Academy of Sciences* ſuch a Plug in an Artery. *Memoires de l'Acad. des Sciences*, 1735.

Mr. *Morand* endeavours to prove that the Contraction of the Coats of Arteries, and the Concretion of their Sides, are the principal and ſureſt Means of ſtopping the Effuſion of Blood from them. *Memoires de l'Acad. des Sciences* 1731.

Some *German* Phyſicians endeavour to reſtore the Reputation of *Digby*'s *Sympathetic Powder* for ſtopping Hæmorrhagies, by relating two Examples of its Succeſs. Violent Hæmorrhagies, ſay they, were ſtopped by dipping a Cloth wet with the Patient's Blood into Water, in which *Cyprian* or *Hungarian Vitriol* calcined in the Sun, had been diſſolved. *Medic. Sileſiac. Satyr.* Spec. 2. Obſ. 8.

Mr. *Godfrey* (*Miſcell. verè util.*) affirms, That by immerſing a burnt Part into cold Water for ſeveral Hours, adding freſh cold Water from time to time, all the Pain of burning may be prevented, and the Part will cure afterwards

with a ſimple Ointment of *Ceruſs*, *Oil*, *Sperm. Cet.* &c.

Wounds of the Head have been long obſerved to be frequently very fallacious; ſome that ſeemed to be very ſlight Hurts, have proved mortal, others attended with very violent Symptoms have cured, with very little Aſſiſtance from Art.

Mr. *Queſnay* examines the doubtful Caſes where the *Trepan* ought or ought not to be applied; and after relating a great many Hiſtories, concludes for performing the Operation as the ſafeſt Method, where it is ambiguous whether there is Extravaſation of Liquors, or Depreſſion of the Skull.

He takes Notice of a Remark of Mr. *Petit*, that where the Patient becomes at firſt ſtupid or lethargic, but recovers from theſe Symptoms ſometime after, they depend on a Concuſſion of the Brain. But either if theſe Symptoms continue, notwithſtanding proper Evacuations, or if they appear ſometime after the Hurt is given, then the Brain is compreſſed.

Mr. *Queſnay* mentions Examples of very contuſed Wounds of the Teguments of the Head, which were cured by Concretion.

Several Caſes are related to prove that the Adheſion of the *Pericranium* to the Skull is no ſure Sign of the Bone's being entire, and

and that the Separation of the *Pericranium* from the Skull, is as unſure a Sign of the *Cranium* being broken.

Examples of Contrafiſſures are alſo related.

He tells ſeveral Hiſtories of the *Trepan* being performed ſeveral Times with Succeſs for the ſame Diſeaſe, and of very large Parts of the Skull being taken away, without Loſs of the Patient's Life.

He remarks that a ſort of *Hernia* is ſometimes formed at the Aperture of the *Cranium*, after a Cicatrice is formed in the Teguments, and mentions a Caſe treated by Mr. *Mareçhall*, where ſuch a *Hernia* occaſioned Convulſions, which were cured by keeping a proper Bandage on the Parts, to prevent their being protruded.

Mr. *Queſnay* ſays, the Apertures of the Skull are ſometimes filled with a Subſtance which comes from the Edges of the Bone, and gradually oſſifies. Sometimes a hard *Callus* has been obſerved to come from the *Dura Mater* to fill the Hole. He encourages Surgeons to open Abſceſſes when they form in the Brain, and even to puſh a Lancet into the Brain, when the Symptoms indicate a Suppuration, though the *Pus* is neither felt nor ſeen.

He aſſures us from Experience, that ar-

dent Spirits are not ſo proper for preventing the Growth of *Fungus* from the Brain as *Balſam. Fierovanti*, or *Ol. Terebinth.* He recommends *Mel Roſar.* as a good Medicine to be injected within the Skull. *Memoires de l'Acad. de Chirurg.* Tom. 1.

Mr. *Petit* conſiders the Canals for the Tears from the *Puncta lacrymalia* as a *Syphon*, the longer Leg of which is the naſal Duct, and therefore thinks that a ſhorter Paſſage made through the *Os unguis* would not convey away the Tears; for which Reaſon he would always have the natural Paſſage forced open in the *Fiſtula lacrymalis*, and to keep a ſmall *Bougie* in it till it heals. *Memoires de l'Acad. des Sciences*, 1734.

The *Pterygion* cured in a Dog, and afterwards in a Woman by bathing with a Malt Spirit, *Commerc. Norimb.* 1739, *Hebd.* 44.

Dr. *Burghart* in a *Chemoſis* or violent inflammatory ſwelling of the Eye, where the *Cornea* was already burſted, dilated the Opening, and extracted the *cryſtalline Lens*, which had come forward before the *Iris*. That *Lens* was ſo changed and ſuppurated, that it reſembled a Piece of white Amber; after extracting it, the Pain of the Eye became milder. *Medic. Sileſiac. Satyr. Spec.* 2. *Obſ.* 4.

Mr.

Mr. *Petit*, after relating the Hiſtory of a Woman who had a complicated Tumor of the *Trachea*, gives two Cautions in ſuch Caſes. 1. To enquire very particularly whether the Patient has the *Lues venerea*. 2. To guard againſt a Ring or Part of the *Trachea* falling into this Pipe when it exfoliates. *Memoires de l'Acad. de Chirurg.* Tom. 1.

Mr. *Bevin* gives a long Detail of the Misfortunes that have happened from hard or ſharp Subſtances that were attempted to be ſwallowed, and of the Method propoſed for remedying each, whether the Body ſwallowed is lodged in the *Oeſophagus*, *Trachea*, *Stomach* or *Inteſtines*. We cannot abridge this Work, and ſhall only obſerve Mr. *Petit*'s Improvement on the Stilet for extracting Pins or Fiſh-bones ſticking in the *Oeſophagus*, which is to have ſeveral little Rings of Wire or Thread at the End of a flexible Probe or Wire. *Memoires de l'Acad. de Chirurg.* Tom. 1.

Mr. *Foubert* obſerved a Tumor between the *Xiphoid Cartilage*, and the Edges of the Cartilages of the Ribs, occaſioned by an Abſceſs within the *Thorax*. *Memoir. de l'Acad. de Chirurg.* Tom. 1.

Mr. *Amyand* relates the Hiſtory of a Gentleman, who, after being cured of an Ague by the *Bark*, complained of Weight, Hard-

Hardneſs and Uneaſineſs in the Liver, with *Borborygmi* and Coſtiveneſs, for which he frequently took Purgatives. After being fourteen Years in this Way, he had ſome Symptoms of the *Jaundice*. After ſeveral Weeks more, an inflammatory Tumor was obſerved in the right Hypochondre, which ſuppurated, and when opened, diſcharged purulent Matter ſome Days. The Quantity of *Pus* decreaſing, there was a ſudden Diſcharge of a great Quantity of yellow bilous Matter from the Sore; 40 Pounds of this were computed to have flowed out in 25 Days. The Symptoms of the *Jaundice* going off; he became coſtive, had Phyſick, catched Cold, fever'd and died lethargic.

His *Gall-bladder* was found extended into a Bag, capable of containing three Pounds of Liquor, and was connected to another ſmaller Bag, where the *Pus* had been lodged. Several Bags were formed in the Coats of the Gall-bladder. Theſe contained a cretaceous Matter, with hard white Stones. The *cyſtic* Duct was ſo contracted or blocked up, that nothing could paſs thro' it. The *hepatic* and the *common bilary* Ducts were open, but empty. A *bilary* Canal, formed of ſeveral Branches which joined within the Liver, opened itſelf into the *Gall-bladder*.

The

The Liver was ſound in appearance. *Philoſ. Tranſact.* Num. 449. § 7.

Dr. *Stuart*'s Account of theſe Symptoms, *ibid.* § 8. may be gueſſed from what is in our *Vol.* III. *p.* 406, *&c.*

Mr. *Petit* gives the Marks by which ſuch a Diſtenſion of the *Gall-Bladder* from *Bile* as makes an external Tumor with Fluctuation, may be known and diſtinguiſhed from an Abſceſs formed in the Liver. In both Caſes there is Fever, Pain, Shivering, Tumor, *&c.* preceding: But, 1. When the Abſceſs begins to form, the Pain increaſes; whereas it diminiſhes when the *Gall-bladder* is diſtended. 2. The Pain of the Suppuration is pulſatory, which the other is not. 3. The Pain goes ſooner off, and leaves the Patient more in Spirits, when there is no Suppuration. 4. The Shivering in the Suppuration continues longer, the Pulſe is ſmaller, and it terminates in a Sweat; whereas in the Diſtenſion of the *Gall-bladder*, the Shivering is of ſhort Continuance, the Pulſe is ſtronger, and there is no Sweat. 5. The diſtended *Gall-bladder* is like an incyſted Tumor, firm, equal and circumſcribed; the Abſceſs is more diffuſed. 6. The *diſtended Gall-Bladder* is always ſeen below the Cartilages of the Ribs. The Abſceſs of the Liver forms any where in the epigaſtric Regi-

on

on. 7. The Fluctuation of the Liquor in the *Gall-Bladder* is all felt at once over the whole Tumor. The Fluctuation of the Abſceſs becomes gradually more perceptible, and there is always ſome Hardneſs round it.

When the Gall is collected in its Bladder, if an Inciſion is made into it, it runs into the Abdomen, and ſoon deſtroys the Patient, unleſs when the Gall-bladder is adhering to the Peritoneum, which Mr. *Petit* ſays may be known to be the Caſe; 1. When the Tumor cannot be made to change Places. 2. By the Sponginеſs and redneſs of the Teguments. 3. By there having been frequent Returns of Inflammation.

When an Abſceſs and a *diſtended Gall-bladder* happen at the ſame Time, it is difficult to diſcover the latter.

When the Gall-bladder can be opened, ſo that the Bile may all be evacuated at the Orifice, it is to be done; and if there are any Concretions lodged in it, they are to be extracted. *Memoires de l'Acad. de Chirurg.* Tom. 1.

Dr. *Kaltſchmied* adds a Stopcock to the *Canula* of his Trocars, that he may evacuate the Water of Dropſies at Pleaſure. *Commerc. Norimb.* 1738. *Hebd.* 38. § 1.

Mr. *Amyand* after deſcribing a tedious Operation of the *Bubonocele* which he performed

formed, where he was obliged to cut away the *Omentum*, which adhered to the Rings of the Muſcles, and to ſeparate the *Appendix vermiformis*, which contained a Pin that had pierced it, obſerves, That *Herniæ* return after the Operation of the *Bubonocele*, as it did in this Patient, and three or four more, and that the *Omentum* may be cut ſafely without any Ligature put upon it.

In the Diſſection of an old *Hernia*, Mr. *Amyand* ſaw one Side of the *Inteſtinum Ilium* ſtretched out into a blind Tube, like to the *Appendix vermiformis*. *Philoſoph. Tranſact.* Num. 443. § 8.

Mr. *Amyand* remarks alſo, that *Herniæ*, where the *Omentum* falls down with the Inteſtines, are more dangerous than where the Gut is alone, becauſe the *Omentum* hinders the Reduction of the Gut, grows to the Rings of the Muſcles, ſwells and forms a thick Ring, which ſtrangulates the Gut.— He again repeats his cutting off a Part of the *Omentum* without tying it, and without *Hæmorrhagy*. *Philoſoph. Tranſ.* Num. 450. § 2.

Dr. *Sacks* greatly recommends Lintſeed, from which the Oil has been expreſſed, boiled in Milk, and applied warm in a Cloth on *Herniæ*. *Satyr. Sileſiac.* Specim. 4. Obſ. 4.

Mr. *De la Peyronie* obſerved the Strangulation of the Inteſtine to continue after the Re-

Reduction of a *Hernia*, occaſioned by the *Omentum* grown to the interior Part of each Side of the Paſſage. *Memoires de l'Acad. de Chirurg.* Tom. 1.

Mr. *De la Peyronie* alſo relates Hiſtories of mortified Pieces of Inteſtines in *Herniæ* cut away, and a Cure made by keeping the Extremities of the Gut near to each other, and near to the Rings of the Muſcles, with a Stitch through the Meſentery. The Ends of the Inteſtine grew to the *Peritoneum*, and the new Fleſh was extended along this Membrane to ſolder the Extremities together. The ſoldered Part of the Gut is always ſtraitned; and therefore, whoever are cured in this Caſe had need to guard againſt too full Meals and Indigeſtion. A Woman who had been cured in ſuch a Caſe as is deſcribed above, and had tranſgreſſed by eating too plentifully, fell into vomiting, which burſted her Gut, and ſhe died in few Hours.

The upper End of a divided Inteſtine ought carefully to be kept near the external Orifice, that the Remains of the Food may not fall into the Cavity of the Abdomen. *Memoires de l'Acad. de Chirurg.* Tom, 1.

Spring Steel Truſſes ſeem to be known but lately in *France*, the Deſcription and Picture of one being inſerted into *Memoires de l'Acad. de Chirurg.* Tom. 1.

Mr.

Mr. *Garengeot* relates Examples of uncommon *Herniæ*, to wit, near the *Xiphoid Cartilage*, into the *Vagina*, and through the Hole common to the *Os Pubis* and *Iſchium*, at the Place where the Veſſels and Nerves paſs. The elaſtic Subſtance they contain, and the common Symptoms of ſtrangulated Inteſtines, may lead one to diſtinguiſh them from the other Tumors of thoſe Parts. *Mem. de l'Acad. de Chirurg.* Tom. 1.

Mr. *Amyand* mentions the Colon being cured after being wounded with a Bullet; when he opened the Body ſeveral Years after, he ſaw the Part of the Gut formerly wounded then conſiderably contracted. *Philoſ. Tranſact.* Num. 443. § 8.

Dr. *Wolfius* relates the Hiſtory of one whoſe *Inteſtinum Ilium* was burſted by the Fall of a Stone on his Belly. *Philoſ. Tranſ.* Num. 445. § 12.

Mr. *Frike* propoſes to employ a *Syringotom* of a new Form, for laying open *Fiſtulæ in ano*, which run up on the Side of the *Rectum*, without having any Perforation into its Cavity. His Inſtrument is of the Form of a Pair of Sciſſars, the Blades of which are about the Breadth of the *Royal Biſtoury*, and are crooked. One of the Blades has a very ſharp Edge, but a blunt Point, the other has a very ſharp Point, but blunt Edge.

Edge. By the Means of a ſliding Button, the blunt Edge of the one, and the blunt Point of the other Blade, are made to ſtand out beyond the ſharp Edge and Point, ſo as to defend them, while the Handles of the Blades are kept at a little Diſtance. The Inſtrument being introduced into the *Fiſtula*, while the two Blades are kept in this Poſture by the Button, whenever the Extremity of it touches the Bottom of the *Fiſtula*, the Button being ſlid away, the Handles are preſſed together, which makes the ſharp Point of the blunt Blade to perforate the Inſtrument, and immediately the Handles being drawn aſunder, the ſharp edged Blade is advanced before the other, and with a Finger of the Left-hand introduced into the *Rectum*, is directed to lay the whole open, as is done commonly with the *Royal Biſtoury*. *Appendix to Barroughby's Tranſlation of Aſtruc's Treatiſe on the Fiſtula in ano.*

Mr. *Faget* adviſes to ſlit open the *Inteſtinum rectum*, whenever it is laid bare by an Abſceſs, and gives an Example of a Cure which he made, by cutting away the Extremity of this Gut, which had been laid bare all round by Abſceſſes. *Memoires de l'Acad. de Chirurg.* Tom. I.

Mr. *Petit.* obſerves, That it is very difficult to hit of the right Part for making a Perfor-

foration into the *Rectum* of Children born without any *Anus*; for he finds generally the Extremity of the Gut formed into a Knot. For performing ſuch a Perforation, he recommends a *Trocar*, the *Canula* and circular Plate of which are ſo ſlit open, as to ſerve as a Groove for a Lancet or Biſtoury to be run in, to inlarge the Aperture, after the *Trocar* has been puſhed into the Gut. *Mem. de l'Acad. de Chirurg.* Tom. 1.

Mr. *Le Cat* was very ſucceſsful in performing the *lateral Operation for the Stone*; he found great Advantage to his Patients from the *warm Bath*, when they were threatned with Inflammation. *Hiſtoire de l'Acad. des Sciences*, 1734.

Mr. *Le Cat* makes a Groove on the right Side of his Lithotomy Inſtruments, which aſſiſts him to introduce them more readily. He employs a narrow convex edged Knife to ſlit the *Proſtata* and Neck of the Bladder; ſince he has made uſe of this Inſtrument, his Operations have been more ſucceſsful. *Hiſt. de l'Acad des Sciences* 1738.

Mr. *Foubert* performs Lithotomy in the following Manner; he either injects a mild Liquor into the Bladder, or he ties a Ligature on the *Penis* to retain the Urine till the Bladder is ſtretched.— When he obſerves that the Bladder is very much contracted,

which he knows by the ſmall Quantity of Urine emitted by the Patients at once, he keeps them drinking large Quantities of a ſoftning Ptizan, recommending to them to retain their Urine as long as they can. The Bladder being diſtended, he thruſts a very long *Trocar*, the *Canula* of which is open on one Side, into the Bladder, from the middle Point between the *Anus* and *Tuberoſity* of the *Os Iſchium*, then drawing the *Stilet* of the *Trocar* back ſome way, he puſhes a Knife along the Slit in the *Canula*, and when it is in the Bladder, he raiſes the Point to cut the interior Parts: Then reſting the Point on the *Trocar*, he raiſes the Handle to make a large enough external Inciſion. For making theſe Inciſions more conveniently, his Knife is narrow bladed, and ſet into its Handle at a conſiderable Angle. The Inciſion being made, the *Gorgeret* is introduced, and all the reſt of the Operation is the ſame as in the common lateral Operation. *Commerc. Norimb.* 1739, *Hebd.* 6, 7, 8. *Memoires de l'Acad. de Chirurg.* Tom. 1.

We are informed by a private Letter from *Paris*, that Mr. *Faget* propoſes a different Way of *Lithotomy* from any yet practiſed. The Patient being in the ſame Situation as for performing the Operation in *Johannes de Romanis*'s Way, the furrowed Catheter, in-

introduced into the Bladder, is puſhed ſtrongly backwards, the Operator cuts the Skin and Teguments from near the *Os Coccygis* to near the *Tuber* of the *Iſchium*, and then with a ſmall Knife, cuts the back Part of the Bladder upon the Groove of the Catheter, introduces the *Gorgeret*, and performs what remains of the Operation in the ordinary Way.

Mr. *Nourſe* ſhewed to the *Royal Society* the Bladder of a Man, in which ſix *Sacculi* or Bags were formed by the Protruſion of the internal Coat of the Bladder through the muſcular. In theſe Bags nine Stones were contained. *Philoſoph. Tranſ.* Num. 462. § 3.

Mr. *Houſtet* has collected a great many Inſtances of Stones lodged in Sacs formed in the Bladder, from which it was impoſſible to extract them, without tearing the Bladder, or cutting one Side of the Sac, which Mr. *Garengeot* did once with Succeſs. In ſome of the Caſes which he mentions, the Veſſels of the Bladder were in Appearance grown into the Stone, and the Extraction of the Stone was attended with a mortal Hæmorrhagy. *Mem. de l'Acad. de Chirurg.* Tom. 1.

Mr. *De la Peyronie* mentions Examples of Impediment to the Ejection of the *Semen*

maſculinum in Coition, by a wrong Direction which the Orifices at the *Veru montanum* got, whereby the Seed was thrown up into the Bladder.

Mr. *Petit* cured one Patient under ſuch a Difficulty of ejecting Seed, by making an Inciſion ſuch as is commonly made for the great Operation for the Stone. *Ibid.*

Mr. *De la Peyronie* remarks, That the hard Knots which form ſometimes in the *Corpus cavernoſum Urethræ* after venereall Virulency, are very difficult to cure. Till the pocky Matter is all got out of the Blood, it is in vain to attempt the Cure of theſe Knots, and even after the venereal Taint is gone, theſe Knots don't yield to Mercury in any Shape, but are reſolved by *Douches* of the Waters of *Bareges*. *Ibid.*

Mr. *Puzos* recommends much the natural Delivery rather than the forced one for Women who have a Flooding, when with Child. His Method with which he has had great Succeſs in ſuch Caſes, is to let Blood, to order Reſt, and a cooling Diet. Theſe Medicines, he ſays, generally ſtop the Hæmorrhagy, which happens in the firſt Months of Geſtation.— If the Flow of Blood continues, he dilates the *Os uteri* gently with his Fingers, and breaks through the Membranes of the *Secundines*, to let the Waters out

out as ſoon as he can. Immediately after this the Pains commonly become brisk, and the Contraction of the Womb ſtops the blooding. In ſome few Caſes where he judges that the Patient would loſe too much Blood, by waiting the natural Delivery, he forces away the Child. *Ibid.*

Mr. *Le Cat* gives the Deſcription and Figures of an *Ambi*, which he has contrived free of the Faults which *Hippocrates*'s *Ambi* has. We cannot repreſent this Machine in an abridged Deſcription, eſpecially without a Picture, and therefore muſt refer to *Philoſoph. Tranſact.* Num. 469. § 2.

A Man whoſe Arm with the *Scapula* was torn off by a Mill, cured without any Hæmorrhagy. *Philoſoph. Tranſ.* Num. 449. § 5.

Two Examples of the *Tendo Achillis*, which had been cut through, being cured without ſtitching. *Commerc. Norimb.* 1740. *Hebd.* 46.

Mr. *De la Faye* who is Author of the Notes added to the third Edition of *Dionis ſur les operations de Chirurg.* mentions ſome Improvements that are not commonly taken notice of.

P. 4. It is a common Objection to ſtitching Wounds of the *Thorax*, that its Motion is conſtant and neceſſary. Mr. *De la Faye*

obſerves, that the moſt conſiderable Muſcles ſituated on the *Thorax* are not employed in its Motions; and therefore are in as little Danger of tearing a Stitch as any other Muſcles; beſides, ſays he, the Motion is not a ſufficient Objection, otherwiſe the *Abdomen* would not be order'd to be ſtitched when wounded.

P. 26. He remarks, That ſometimes in a Palſy of the Coats of the urinary Bladder, the Bladder is raiſed into a Tumor above the *Oſſa Pubis*, which he warns Surgeons not to miſtake for an Abſceſs. The ſame Caution is alſo neceſſary, when the Gall-bladder is diſtended much with its Contents, and appears prominent below the Edges of the Cartilages of the Ribs.

P. 31. In Inflammations of the *Urethra* and Neck of the Bladder, when there is a Neceſſity of ſounding the Patient to let out the Urine, Mr. *De la Faye* approves of Mr. *Petit*'s hollow Catheter, which ſo far differs from the common one, that it is open only at the Extremity, which can be ſhut, by drawing backward a ſmall pyramidal Button at the Extremity of the Wire. He alledges, that the ſwelled Membrane of the *Urethra* forces itſelf into the Openings at the Sides of the *common Catheter* near its Point, and is fixed ſo firmly in them, that the *Catheter*

theter cannot be taken out, after it is introduced, without much Pain, Hæmorrhagy, and Increaſe of the Inflammation. He adviſes the *Catheter* imployed in ſuch a Caſe, not to be near ſo crooked as it is commonly made, that it may be more eaſily introduced.

P. 54. It is a general Direction given by the Writers of chirurgical Operations, that when the Operation for a *Hernia* is performed, where the *Viſcera* are grown to the containing Parts, the Bowels ſhould be diſſected away and reduced. Mr. *De la Faye* adviſes rather to let the Bowels remain, and only to remove the Cauſe of Strangulation, when the Coheſion is intimate. He gives Examples of the Succeſs of this Practice. In ſuch Caſes eſpecially the Surgeon ought to examine whether any Part of the Inteſtine lately faln down and not cohering, is engaged in the Ring of the Muſcles, and to take Care to reduce it.

P. 58. He relates Hiſtories of great Pieces of gangren'd Guts taken away, after which the Extremities being kept together by a Ligature, united.

P. 70. Mr. *Gerard* having tied a Doſſil in the middle of a Thread, which he put round a Rib, where the intercoſtal Artery had been wounded, and having applied the Doſſil

upon the Artery, he tied the two Ends of the Thread on a Compreſs placed on the Outſide of the Rib, and thus ſtopped the Hæmorrhagy.

P. 102. Mr. *Morand*, he tells us, extirpated a *Polypus* of the Noſe, with one Finger in the Noſtril, while he introduced another Finger by the Mouth above the Palate, and with the two Fingers ſeparated the *Polypus*.

Mr. *Sharp* (*Operations of Surgery*, Chap. 9.) ſeems to diſwade Surgeons from making any large Opening into the *Tunica vaginalis* of the Teſticle, for the Cure of a *Hydrocele*; he mentions three Patients of his, who had near loſt their Lives after ſuch an Operation; very violent Tenſion and Inflammation were brought on another, by injecting an Ounce of Spirit of Wine at the Puncture, by which the Water of a *Hydrocele* had been evacuated.

Chap. 10 He affirms that all Indurations of the glandular Part of the Teſticle, not tending to Inflammation and Abſceſſes, generally, if not always, lead on to *Schirrhus*, whereas thoſe Tumors of the *Epidydimis* ſeldom or never do ſo.

Chap. 24. He condemns the Operation of the *Empyema*, for evacuating Blood or *Pus*, but allows it for voiding Water, and then

then would have the Opening made between the 5th and ſixth Ribs, and half Way between the *Vertebræ* and *Sternum*.

Chap. 27. Mr. *Sharp* adviſes always to cut away an oval Part of the Scalp, in order to examine whether or not the Skull is fractured, rather than to make a crucial Inciſion, as is commonly directed; for, ſays he, if the *Trepan* muſt be performed, the Teguments muſt be cut away, and if that Operation is not neceſſary, theſe contuſed Teguments ſerve only to keep in the Matter, and to corrupt the Bone.

Ibid. He prefers the *Treſine* to the *Trepan*, becauſe in his Opinion, the *Trepan* is more unhandy, and there is greater Convenience of holding the *Treſine*, and leaning on one Side or other of the Saw. He would have the Heads of the *Treſine* to be made of a cylindrical Form inſtead of the conical, which was once thought a great Improvement, to prevent any Chance of the Inſtrument plunging in upon the *Dura Mater* and Brain. His Reaſon for preferring the cylindrical Form is, That leſs Force and Time are required to perforate the Bone with it, than with the conical.

Chap. 32. Mr. *Cheſelden* deſtroys ſwelled *Amygdalæ*, by tying Ligatures round their Baſe, which he does either by putting a ſingle Thread

Thread round the Baſe with a Knot, which he draws tight, by keeping one End of it firm in the *Fauces* on a Ring on the End of a *Stilet*, while he draws the other with his Fingers; or with a Needle, the Eye of which is near the Point, and having two Threads in it, he perforates a very large *Amygdala* in the middle, making a Ligature on each Half with each Thread. Mr. *Sharp* ſays he has extirpated Hemorrhoids this Way.

We have at laſt a complete Body of Surgery in Mr. *Heiſter*'s *Inſtitutiones Chirurgicæ*, where all the different Parts of Surgery are fully treated, and little is omitted that has been hitherto wrote on that Art.

To point out the Uſe which might be made of a continued and regular Series of Obſervations of the Changes in our Atmoſphere, and of the Diſeaſes in the different Seaſons; and to ſhew the Advantage which might be reaſonably expected from them, we ſhall copy the *Aphoriſms* which Dr. *Hilary*'s Friend has collected from the Doctor's Obſervations of that kind. (*Appendix tacked to his Treatiſe on the Small-pox.*)

1. *Continued warm dry Seaſons* are productive of inflammatory Diſeaſes, in which the Head is chiefly affected. Maniac, and melancholy or hypochondriac Affections are likewiſe more frequent after ſuch Seaſons.

2. *Con-*

2. *Continued cold and dry Seaſons* are productive of inflammatory Diſeaſes, in which the Head is ſometimes, but more frequently the Bowels, are affected.

3. In *warm moiſt Weather*, epidemical Diſeaſes are gentle and moderate, and Perſons are diſpoſed to ſlow continual Fevers, with little Heat or Thirſt. This Conſtitution likewiſe takes off Diſeaſes which owe their Riſe to a *cold dry Seaſon*.

4. *Continued cold and moiſt Seaſons* produce Diſeaſes attended with ſerous Defluxions and Inflammations of the glandular Parts; Quinſies, Catarrhs, Fevers, *Aſthmas*, *Peripneumonies*, *Diarrhæas*, with remitting and violent intermitting Fevers, Apoplexies and Palſies.

5. Fevers cauſed by ſuch a Conſtitution of the Air, for the moſt Part are attended with *Stupors*, frequent ſymptomatical Diſcharges by Stool, partial and univerſal Sweats (but without any Relief) rendring the Habit infirm and obnoxious to long intermittents, and tedious chronical Diſorders.

6. A Change from *hot* and *dry*, to *cold* and *moiſt*, puts an End to thoſe Diſorders which proceed from the firſt mentioned State of the Weather; or changes their Appearance in proportion to the Quickneſs in which they ſucceed each other; violent inflammatory Fevers

Fevers are now alſo frequent, chiefly affecting the membranous Parts, as the *Larynx*, *Pleura*, Lungs, Stomach, and the membranous Coverings of the Joints, occaſioning *Pleuriſy*, *Rheumatiſm*, &c.

7. When a *hot* and *dry Seaſon* ſucceeds a *cold* and *moiſt* one, if the Change is gradual, it takes off the Diſeaſes produced by the preceeding Conſtitution, and occaſions Intermittents: But if it is ſudden, it renders thoſe Diſtempers malignant. The *Small-pox* in ſuch a Conſtitution moſtly become of a worſe kind.

The Year 1731 was a very dry Seaſon about *Paris*, during which, Dryneſs of the Mouth, Sickneſs, *Nauſea*, Diſorders in the Throat, ſeveral of which were Quinſies, different Fluxions to the Head, and ſeveral ſorts of irregular obſtinate Fevers were very frequent at *Paris*. Mr. *Juſſieu* obſerving thoſe who drank the Water of the *Seine* to be generally attacked with theſe Diſorders, examined the Water of that River, and of the *Marne*, and found them bitter and acrid to the Taſte, which, he thinks, was owing to the more than ordinary Quantity of *Hippurus* and *Conferva* propagated that Year in thoſe Rivers, and their Sources, and corrupting there, while there was a leſs Quantity of Water to dilute the Tincture taken from them, which

cauſed

cauſed the Diſeaſes above-mentioned. *Memoires de l'Acad. des Sciences*, 1733.

Dr. *Huxham* (*Obſervationes de aëre & morbis epidemicis*, &c.) not only mentions the Method of treating the ſeveral *epidemic* Diſtempers which prevailed, during the nine Years of his Obſervations, but in his Notes enters into the general *rationale* and Cure of ſeveral, where there are many good practical Hints. We ſhall tranſcribe ſome of them.

P. 25. To thoſe who were recovering from obſtinate intermitting Fevers, he preſcribed the *cold Bath* as a Strengthner, to prevent a Return of the Diſeaſe, and it was very ſucceſsful.

P. 64. Expectoration is to be promoted in the *Peripneumony*, but is not to be expected in a genuine *Pleuriſy*, in which common Pectorals are of no more Uſe than in an Inflammation of the Leg.

P. 66. In the *Kinkcough* he uſes the common Evacuations, and propoſes to correct the *Lentor* of the Blood, and to ſtrengthen the Nerves and Stomach by Mercurials, *Cortex Peruvianus*, and proper Stomachics.

P. 141. He recommends much ſmall Doſes of emetic Wine, as a Deobſtruent and Sudorific in ſlow Fevers, in many chronical

cal Diſeaſes, and eſpecially in an obſtinate Rheumatiſm.

P. 145. He has thouſands of Times experienced the good Effects of *Tartarus regeneratus* in the Cure of Obſtructions of the Bowels, and for ſluggiſh Humours, but propoſes a more penetrating Medicine, to wit, *Salt of Hartſhorn*, ſaturated with *Spirit of Vinegar*, which not only takes away the fetid Smell of the Oil of the Salt, but changes it into an agreeable Aromatic.

We regrete that we cannot bring what he has ſaid on *ſlow nervous Fevers* and the *Colick of Devonſhire*, into a ſmall enough Space to be inſerted here.

Dr. *Cheyne* (*Rational Method of curing Diſeaſes*) recommends *Milk* and *Seed-diet* with Water for Drink, as the ſureſt Preſervative againſt Diſeaſes, and Cure of them; among other Examples of the Efficacy of this Diet, he ſays, (*p.* 150. 263.) that a total Aſs-milk Diet, (about two Quarts a Day, without any other Food or Drink) will in time cure a Cancer; and when, to the Milk and Seed-diet ſome of the proper Medicines for the ſeveral Diſtempers are joined, Cure may be made (*p.* 264.) of beginning Conſumptions, (*p.* 265.) *Hemiplegia*, or dead Palſy, (*p.* 267.) *Gonorrhæa* and Pox. (*p.* 268.)

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an habitual *Aſthma*, (*p.* 269.) Hæmorrhagies (*p.* 270.) Leproſy, *&c.*

Water or *Sherbet* made of Juice of Oranges and a little Honey, is, according to Dr. *Cheyne* (*p.* 172.) the beſt Drink in a Dropſy. (*P.* 173.) An *Anaſarca* may be cured by Exerciſe and drinking Water. (*P.* 123.) He prefers plain liquid Quickſilver, *Æthiops*, *Mercurius alcaliſatus* or *Cinnabar* to all other Preparations of *Mercury*; and in theſe Forms it is a favourite Medicine with him.

Dr. *Martin* (in *One of his Eſſays*) defends the Antients in the Rules they laid down concerning the *Periods* and *Criſes* of Diſeaſes, endeavouring to prove that they are founded on accurate Obſervations.

An hydropic Body became ſo infectious, that the Surgeon who tapped the Corpſe was thrown into a peſtilential Fever, *Philoſoph. Tranſact.* Num. 454. § 4.

The *Indians* in *America* have a very ſubtile Poyſon which they make uſe of ſometimes; Dr. *Burgeſs* ſays, the Antidote to this is the Root of the ſenſitive Weed, *Herba ſenſitiva*, of which a Handful is boiled in three Quarts of Water. The Doſe of this Decoction is a Glaſsful every Hour. *Philoſoph. Tranſact.* Num. 462. § 2.

Dr. *Maſnechelli* tells us, That in the Plague among

among the Cattle in *Italy* in 1735, Rue, Wormwood, Garlick, and ſuch other ſtrong ſmelling Plants hung about their Noſes and Mouths, were eſteemed Preſervatives againſt the Infection. Nitrous Medicines, Gun-powder, Sulphur, and the ſharper Aromaticks given to the Cattle did hurt. Bleeding, Crude Antimony with Setons, and a Diet of the moſt mild ſoftning Herbs did Service.

Dr. *De Sault* (in his Treatiſe on the *Rabies Canina*) argues for the *Rabies* depending on ſmall Worms, of which, he ſays, there are a great Number found in the Heads of thoſe who dye of this Diſeaſe. From the Analogy of this terrible Diſeaſe with others, ſuch as the *Itch*, *Lues Venerea*, &c. which in his Opinion are alſo contagious, by *Worms* communicated from one Perſon to another, he was led to think that the Cure of the *Rabies* was only to be performed by *Mercury*, and the Succeſs confirmed his Theory; for of four Men who had all been bit at the ſame Time by the ſame Wolf, two were treated by the common Specifics of plunging in the Sea, *&c.* and died ſome Days after of the *Rabies*. The other two having all the Signs of an approaching *Rabies*, were cured by Mr. *De Sault*'s Method, which is this.—— If he is conſulted immediately after the Perſon is bit, he orders him to be bathed

bathed in the Sea, that the common Confidence in this Remedy may calm his Mind. As soon as the Patient returns, the Doctor puts him on the Use of *Palmarius*'s Powder composed of *Fol. Rut. Verben. Salv. Plantag. Polypod. Absinth. vulg. Menth. Artemis. Meliss. Betonic. Hyperic. Centaur. min. a. partes æquales*, with some *Coralline*. A *Drachm* of this Powder is to be taken every Morning in a Glass of white Wine or warm Water. This he gives twenty or thirty Days, as there is more or less Presumption of the Poyson having entered the Blood. From the first Day of taking the Powder, he rubs a *Drachm* or two of *Ung. Neapolit.* upon the Wound and Skin round it every other Day. After doing this thrice, he applies the Ointment every third Day, and afterwards every fourth Day, till he has made use of two or three Ounces of the Ointment.— If the Patient has delayed several Days to take his Advice, he uses the Mercurial Friction three or four Times a Day, for four Days, and increases the Dose of *Palmarius*'s Powder; then forbears the Inunction two Days, lest a Salivation be brought on.— Our Author likewise recommends Musick as of use to calm the Mind, and divert the Fear which People in Danger of this Disease generally have.

Dr. *James* relates the Cure he made of Dogs that were mad, and how he preſerved others from the *Rabies*, who had been bit by mad Dogs, by giving Doſes of *Turbeth Mineral* every Day, or every other Day. The other Dogs of the Pack that had been bit died notwithſtanding the famous *Peuter Medicine*, dipping in the Sea, and the other common Specificks.— The Doctor likewiſe mentions three People who were bit by mad Dogs, and eſcaped the *Rabies* by the Uſe of the *Turbeth*. *Philoſoph. Tranſact.* Num. 441. § 8.

Mr. *Fuller* relates the good Effects of the *Pulv. Antyliſſus* compoſed of *Lichen. ciner. terreſt. & Piper nigr. aa.* in preventing the *Rabies*. *Philoſ. Tranſ.* Num. 448. § 5.

A Perſon who had been bit by a mad Dog, and began to have Symptoms of the *Rabies*, was ſaved, by having 120 Ounces of Blood taken in a Week, and being bathed in cold Water by Mr. *Hartley* and Mr. *Sandys*. *Philoſ. Tranſact.* Num. 448. § 6.

Mr. *Nourſe* relates the Hiſtory of a Lad bit in the Thumb by a mad Dog; he took Morning and Evening a *Drachm* of the *Pulv. Antyliſs.* forty Days, and bathed in the Sea ten Days; he was cut for the Stone ſoon after, and recovered very well; nineteen Months after which he died, with all the

the Symptoms of the *Hydrophobia*. *Philoſoph. Tranſ.* Numb. 445. § 2.

Vinegar is recommended by Dr. *Kramer* as a Specific againſt the *Hydrophobia*, eſpecially if ſome Powder of *Cantharides* is mixed with it. The Receipt given him was to boil from four to ten Grains of the fine Powder of *Cantharides*, in an Ounce and a half, or two Ounces of the beſt *Vinegar*, which is to be given warm to the Patient. *Commerc. Norimb.* 1735. *Hebd.* 11. § 3.

For the Cure of the *Lues venerea*, Dr. *De Sault* (in his Treatiſe on this Diſeaſe) recommends frequent Frictions of large Quantities of Mercurial Ointment made with one third of Quickſilver, to wit, from two or three *Drachms*, to an Ounce, or an Ounce and a half every Night, or every other Night, taking Care to keep the Belly in a purging Way, by Clyſters, Laxatives, or the ſtronger Purgatives, if the Mercury begins to affect the Mouth. He ſays this Method is ſure and altogether ſafe, and he relates ſeveral Hiſtories of Cures performed by this Method, not only in the *Lues venerea*, but in many other Diſeaſes, particularly in obſtructed hardned Glands, the Liver, *Teſtes*, &c.

Mr. *Douglas* (*Letter on the Cure of the* Lues venerea) commends greatly *De*

Sault's Method; and we are informed by private Letters, that it has been practised with Success in some of the Hospitals in *London*.

Dr. *Werlhoff* prefers frequently repeated small Doses of Mercury to a Salivation, for the Cure of the *Lues Venerea*. *Commerc. Norimb.* 1735. *Hebd.* 13. § 4.

Dr. *De Sault* (*Dissertation on the Gout*) being of Opinion that the *Gout* depends on want of Perspiration, proposes warm Baths, Exercise, keeping always, and defending from Cold, clean Cloths, moderate eating, abstaining from Supper, Tranquillity of Mind, Friction and Milk-diet, as Preservatives from it. *Garlick* being observed by *Sanctorius* to increase Perspiration is recommended, as are *Cortex Peruvianus* and *Steel* in Winter.--- When the Stomach is attacked, he lets Blood at the Ancles, and applies Epispasticks of different Kinds to the Feet, and then endeavours to procure a general Sweat.— When the Pain is very violent, he blunts it, by applying a Cloth dipped in *liquid Laudanum* to the pained Part, and exhorts the Patient to use Exercise after this.

Dr. *Buddeus* endeavours to prove that the preternatural Ossifications which are commonly said to be formed in different Parts of the Body, do not deserve that Name, for that

that theſe hard Subſtances have ſcarce any other Properties of Bone, except the Whiteneſs and Hardneſs. *Miſcellan. Berolin.* Tom. 5. Pars 2. § 1.

Dr. *Schlichting* affirms that the *Spina ventoſa* is cured by rubbing the Tumor twice a Day with *Ung. Neapolit.* preventing Salivation by gentle Cathartics. *Philoſoph. Tranſact.* Num. 466. § 10.

Mr. *Petit* ſays, the true *Aneuriſm*, which he calls *Aneuriſm by Dilatation*, contains Fluid Blood, yields to Preſſure; and the Noiſe of the Liquor ruſhing into it may be heard; whereas in the *Baſtard* Kind, which he calls *Aneuriſm by Effuſion*, the Blood is coagulated, and therefore cannot be made to return into the Veſſel, nor can any Sound be heard. *Memoires de l'Acad. des Sciences*, 1736.

Mr. *Du Vernoy* deſcribes an aneuriſmal Sac ſituated on the third to the ſixth *Vertebra* of the *Thorax*, which he ſays was the *Aorta* dilated into a Sac ſix Inches and a half wide, and as many Inches long. Its Coats had a great many bonny *Laminæ* in them, and were raiſed into unequal Protuberances. The poſterior Part of this Sac adhered ſo firmly to the carious Bodies of the *Vertebræ*, that it was impoſſible to ſeparate them, and three large Depreſſions

were made ſo deep into the *Vertebræ*, as to be within a Line or two of the Cavity for the *Medulla ſpinalis*. He ſeems to think the *Aneuriſm* was owing to the *Caries* of the Bones, by which the Support which Arteries, according to him, generally have on ſome one Side was taken away. The Man who had this *Aneuriſm* was plump, well coloured, and in Appearance healthy.

Mr. *Du Vernoy* has mentioned alſo more Ligaments of the *Vertebræ* of the Back, than are commonly deſcribed. *Comment. Acad. Petropolit.* Tom. VI.

A Man in an inflammatory Fever, being let eight Ounces of Blood in a Morning faſting, Dr. *Stewart* poured off from the *Coagulum*, four Ounces of a white Liquor reſembling Milk, which had no Smell at firſt, but became very putrid with the Smell of rotten Eggs, whereas Chyle or Milk turns ſour and coagulates. Few Days after, the Man being again blooded when he was free of the Fever, the *Serum* was clear in the common way. *Philoſoph. Tranſact.* Num. 442. § 9.

Dr. *Hilary* (*Treatiſe on Small-pox*) obſerves, *p.* 52. That in the *Delirium*, which ſometimes comes on in the fourth or fifth Day after the Eruption of the *Small-pox*, one will ſee the Bottom of the Eye of a ſparkling

ſparkling fiery red Colour, which is a dreadful Symptom.

P. 58. He recommends the Preparation of thoſe who have not had the *Diſeaſe*, to be made by antiphlogiſtic Purgatives, ſmall Doſes of Mercury, and low cooling Diet, and ſays, *p.* 61. That he always obſerved the Diſeaſe more mild and favourable, the Symptoms more moderate, and the Puſtules fewer, the longer this Method was continued before the Perſon was infected; nor did he ever ſee the *confluent Small-pox* follow the Uſe of this Method, even when the Perſons were infected by thoſe who had the *confluent* kind, and though they were of Families where this Diſeaſe had frequently been fatal.

Our Author recommends Blood-letting in all the *Stadia* of the *Small-pox*, when the Fever becomes high, or other Symptoms indicate it, and generally he orders the *Cool Regimen* through the Courſe of the Diſeaſe, remarking when this Management ought to be changed.

P. 141. He argues for the Poſſibility of preventing the Diſeaſe altogether, by treating it, according to *Boerhaave*'s Propoſal, in the ſame way as any other inflammatory Diſeaſe.

Dr. *Martin* of *Lauſanne* recommends

bathing the Face and Body with Cloths dipped in tepid Water every four Hours during the Eruption of the *Small-pox*, aſſuring that this has excellent good Effects. *Hiſt. de l'Acad. des Sciences*, 1737.

Dr. *Haller* tells us, That *Camphire* aſſiſts greatly to fill the Puſtules of the *Small-pox* of the *confluent* kind, with *Petechiæ*. *Commerc. Norimb.* 1736. *Hebd.* 10. § 1.

The *Quartan Ague* is ſaid to be cured by a Medicine compoſed of *Euphorbium*, *Reſine of Jallap*, *Merc. dulc.* and *Sugar*. *Commerc. Norimb.* 1739. *Hebd.* 42.

Dr. *Michelotti* relates the Cure of a young Man who, after being expoſed to very hot Weather at Sea, and having committed violent Debauches in Drinking, became mad, without any Fever. He was cured by violent blooding, ſtarving, weak very cold Drink, the cold Bath, and pouring cold Water on his Head. *Hiſtoir. de l'Acad. des Sciences*, 1734.

A Woman with Child cured of a violent *Vertigo*, by ſmoaking Tobacco. *Commerc. Norimb.* 1737. *Hebd.* 4. § 3.

A Lady who had an extraordinary Paralytic Diſorder of her Eye-lids, which ſhut every Night about ſix o'Clock, with a running of white Matter, and which remained ſo till next Morning, was cured in few Days by

by having the Waters of *Balleruc* near *Montpelier* pumped upon her Neck, and the back Part of her Head. *Philoſoph. Tranſ.* Num. 449. § 4.

A Woman had a ſurpriſing *Catalepſy*, her Members keeping all the Poſtures they were put into, as if ſhe had been made of Wax. *Hiſt. de l'Acad. des Sciences*, 1738.

Mr. *Maloet* relates the Hiſtory of a Man, who for three Years had a violent Pain at the lower Part of the Forehead, towards the left Side, and near the Root of the Noſe. It was ſometimes more violent than ordinary, and ſhooted ſo to the Eye of that ſame Side, that he thought he would have loſt his Eye. He had a conſiderable buzzing Noiſe in his Ear. To relieve this laſt Symptom, he poured daily ſome Drops of *Oil of Almonds* into his Ear for ſome Days, lying on his oppoſite Side ſometime after dropping in the Oil. Two Days after beginning the Uſe of the Oil, he was ſenſible of an itching and ſtinging in the Noſe, with an Inclination to ſneeze; and at laſt he felt ſomething moving within his Noſtril, which he brought away with his Finger. It was a *Worm* of the *centiped* kind about an Inch and a half long, which run ſwiftly when laid on his Hand. It lived five or ſix Days among Tobacco in a Box. The Patient was

free

free of his Pain ever after.—— Mr. *Littre* told ſuch another Caſe in 1708, of a larger *Centiped* voided at the Noſe, after it had thrown the Woman, in whoſe *frontal Sinus* it was, into Convulſions, and had almoſt taken away her Reaſon from her. Mr. *Littre* attributed its coming away, to her ſnuffing Tobacco for ſome time; whereas Mr. *Maloet*'s one lived among Tobacco, and the Man had been in uſe to ſnuff it. *Hiſt. de l'Acad. des Sciences* 1733.

Mr. *Demours* (*Diſſertation ſur les Maladies des yeux*) accounts for the *Mydriaſis* or Dilatation of the Pupil, where Objects appear too little, from the Dilatation of the Veſſels of the *Iris*, which compreſs the ciliary Nerves, and theſe again affect the exterior Fibres of the optick Nerve ſo as to make them unfit to convey the Impreſſions of the Rays which fall upon them; ſo that the ſenſible Part of the Bottom of the Eye, being reduced to a ſmall Surface, the Pictures of the viſible Objects muſt be ſhortned, and the viſual Angle, by the largeneſs of which we judge of the Magnitude of Objects, muſt be diminiſhed, and therefore, ſays he, notwithſtanding the Dilatation of the Pupil, Objects will appear leſs.— That it may not be thought that the Diminution of the ſenſible Surface of the Bottom of the Eye, would

would only make the Perſon loſe the Sight of Part of the Object, Mr. *Demours* endeavours to ſhew that, in the *Mydriaſis*, the Rays coming from the ſeveral Points of Objects are not collected regularly into Points again in the bottom of the Eye, as, ſays he, is evident from the confuſed Viſion which ſuch People have of all Objects; and therefore the neareſt of theſe ſcattered Rays may fall on what remains ſenſible, and there form a whole, but a leſs and more confuſed Picture than in a ſound Eye.

When the Tears are ſharp, he propoſes that the Patient ſhould always ſleep lying on the Side oppoſite to the affected Eye, that the Tears may ſooner paſs off by the *Puncta lacrymalia*, and thereby may have leſs Chance of eroding the *Cornea*, and of making a long tranſverſe Cicatrix on that Coat.

He recommends the *Cruſt of Sugar*, in which there is more Oil than in refined Sugar, as a good Ingredient in *Collyria*, for deterging Ulcers of the *Cornea*, in which Aſtringents are hurtful.

When the aqueous Humour of the Eye is evacuated at a Wound or Ulcer of the *Cornea*, there is Danger of the *Iris* growing to the *Cornea*, which afterwards may prove very uneaſy, by too much Light offend-

fending the Eye. To prevent this Adheſion, Mr. *Demours* propoſes to expoſe the Patient to Light from Time to Time, till the *Cornea* is again raiſed by the aqueous Humour, for the Light occaſions a Motion in the *Iris*, which may prevent the Concretion of the *Iris* to the *Cornea*.

Dr. *May* having diſſected two Eyes of the ſame Perſon which had been couched for Cataracts, ſaw the opaque depreſſed *Cryſtalline* in the one, *that* which had recovered Sight; but in the other he could obſerve only an opaque Membrane, which he believed to be the *Capſula* of the *Cryſtalline*, which had been puſhed out before it was ripe. *Commerc. Norimb.* 1733. *Hebd.* 4. § 3.

Dr. *Agricola* likewiſe diſſected two cataractous Eyes of the ſame Perſon; one of them which was judged to be ripe, had no Adheſions of the *Capſula* of the opaque *Cryſtalline*, and was depreſſed very eaſily. The other required a conſiderable Force, the *Iris* being ſtretched different ways, and part of the black *Pigmentum* of the *choroid* Coat was ſeparated before it was removed out of its Place. The *Capſula* of the *Cryſtalline* was tranſparent in both. In the ripe Eye purulent-like Matter was every where interpoſed between the opaque *Cyſtalline*, and its

Cap-

Capſula. The *Cryſtalline* divided into *Lamellæ.* The purulent Matter and hardned *Cryſtalline*, were both heavier than Water, for they ſank in it, but the *Capſula* ſwim'd. *Commerc. Norimberg.* 1735. *Hebd.* 18.

No Water was found in either Stomach or Lungs of drown'd Whelps. *Medic. Sileſiac. Satyr.* Spec. 2. Obſ. 2.

A Girl remained a Quarter of an Hour under Water without being drowned. *Philoſ. Tranſ.* Num. 454. § 3.

Dr. *Burton* (*Eſſay on Chincough*, tacked to his Treatiſe on the *Non-naturals*) declares againſt Bleeding, Vomiting, and Purging in the *Kinkcough*, except in very urgent Caſes; the Medicine which, he ſays, has had great Succeſs, is a *Scruple* of fine Powder of *Cantharides*, and as much *Camphire* mixed with three *Drachms* of the *Extract of Jeſuits Bark.* Of this Mixture he gives eight or nine Grains to Children every third or fourth Hour in a Spoonful of ſome ſimple Water, or ſome Julap, in which a little *Balſ. Copaib.* had been diſſolved. He ſays this Method is not proper in ſuch *Kinkcoughs* as proceed from thin ſharp Rheum, but he believes that in the Kinkcough from a tough viſcid Phlegm, it will ſcarce ever fail, at leaſt it has not failed yet.

Dr. *Hoyer* informs us, That a moſt violent

lent *Hiccough*, which had reſiſted a great Variety of Medicines, was at laſt cured by ſucking Womens Milk, *Act. Acad. Nat. Cur.* Vol. IV. Obſ. 33.

A particular Example is related to confirm the general Prognoſis which ſome have made of a *Pleuriſy* being deadly, when purple Spots ſupervene upon it. *Medic. Sileſiac. Satyr.* Spec. 2. Obſ. 7.

Mr. *De Sault* (*Diſſert. ſur la Phthiſie*) endeavours to prove that a Conſumption of the Lungs always depends on Tubercles, and that an Ulcer there, is only an Effect of theſe Tubercles, and when the Diſeaſe is in its laſt *Stadium* and incurable, and then only becomes contagious, by ſmall Worms which it communicates to others.

The Cure which our Author propoſes for the Conſumption, before it comes to the laſt Stage, is to reſolve the Tubercles with *Mercury*, *Steel*, *Millepedes*, and the aperient and antiſcorbutick Plants. He remarks that the Liver is generally hard in this Diſeaſe; and therefore he applies a warm Mercurial Plaiſter on the right Hypochondriac Region, rubbing ſome mercurial Ointment every Night on the Skin of that Part; then continues in the Uſe of Tablets made with *Steel*, *Millepedes*, *Benzoin*, *Coral* and *Crabs Eyes*, of each half an Ounce, *Cinnamon* three

Drachms

Drachms, *Sugar* half a Pound, mix all with the Mucilage of *Gum Tragacanth* made with Orange Flower Water. The Doſe of theſe Tablets is two *Drachms* Morning and Evening, waſhing it down with a Ptizan made of the Roots of Nettles, two Ounces of the Juice of Water-creſſes, and as much Juice of Cervill. He ſays this Method, with riding has often been ſucceſsful.

Dr. *Kramer* obſerves, That all Boys at the Time of Puberty, between twelve and fourteen Years of Age, complain of Uneaſineſs in their Breaſts, which are ſwelled and itchy, the *Nipples* and *Areolæ* round them inflamming with Pain, ſometimes Excoriation and Exulceration of ſome of the lactiferous Ducts. The beſt Remedy for which, he ſays, is to preſs out the white *Serum* then contained in them, after which they cure with a bit of Plaiſter. *Commerc. Norimb.* 1735. *Hebd.* 30. § 2.

Mr. *Lieutaud* found the *Gall-bladder* of of a human Body contracted greatly with its Orifice blocked up by a black bilious Concretion, the larger Extremity of which was lodged in a Sac formed between the Membranes of the *Gall-bladder*, in which a clear watery Liquor was contained, and as its Sides were white, he thinks it probable that no Bile had ever been in it. The *hepatic* and

and *Cyſtic* Ducts were greatly dilated and full of Bile; from which he concludes, That the *cyſtic Bile* is not ſecerned in the Coats of the Gall-bladder, nor conveyed into it by *Hepato-cyſtic* Ducts. *Hiſt. de l'Acad. des Sciences*, 1735.

Mr. *Du Vernoy* mentions Tumors of different Figures ſtanding out from both the external and internal Surface of the Inteſtines, they were clear, tranſparent, containing nothing but Air, and very different from what *Ruyſch* mentions. *Comment. Acad. Petropolit.* Tom. 5.

Dr. *Killner* tells us of two People who were cured of an epidemic *Dyſentery*, by a violent drubbing. *Act. Acad. Nat. Cur.* Vol. 4. Obſ. 113.

Dr. *Wolf* relates the Caſe of a Woman with Child, who was ſeized with a total Suppreſſion of Urine, by the Womb falling down, and preſſing on the *Urethra*. *Act. Acad. Nat. Cur.* Vol. 4. Obſ. 20.

Dr. *De Sault* (*Diſſert. ſur la Pierre*) is very poſitive that the hot ſulphureous Waters of *Barege* would diſſolve a Stone in the Bladder, if they were drank long and in large Quantities; were injected into the Bladder, as Mr. *Hales* propoſes; (ſee our Vol. II. *p.* 400,) were given in the Form of Clyſter and were let fall on the hypogaſtric Region.

Mrs.

Mrs. *Stephens* having ſold Medicines for the Stone in the Bladder or Kidnies ſome Time, Dr. *Hartley* publiſhed ſeveral Caſes of their Succeſs; and ſo much was ſaid of them, that the Parliament appointed Truſtees to examine into the Truth of what was alledged in her favour: The Report of theſe Truſtees being favourable, ſhe had Five thouſand Pounds *Sterling* ordered for publiſhing the following Receipt.

Her Medicines are a *Powder*, a *Decoction* and *Pills*. The *Powder* is ſix Parts of fine Powder of *Hen Egg-ſhells* calcined till they become of a greyiſh white Colour, and of an acrid ſalt Taſte, then left two Months in an open Veſſel, till what is ſufficiently calcined falls into a fine Powder, to be ſeparated from the groſſer Parts, by paſſing it through a Hair Sieve. To this Egg-ſhell Lime, add one ſixth Part of Powder of *Snails*, with their Shells burnt in a Crucible, till they have done ſmoaking.— A *Drachm* of this Powder is to be taken thrice a Day, in a large Tea-cup full of white Wine, Cyder or ſmall Punch; and half a Pint of the Decoction is to be drank after each Doſe.— If the Patient has Pain, it is to be made milder by Opiats.— If he is coſtive, gentle Laxatives are to be taken, and purging is to be reſtrained.— If the Powder

is too ſtrong in the above Proportion of ſix Parts of the Powder of *Egg-ſhells* to one of *Snail-powder*, it is to be weakned by increaſing the Proportion of the *Snail-powder*.

To make the Decoction, ſhe prepared Balls compoſed of four Ounces and a half of the beſt *Alicant* Soap, a large Spoonful of the Powder of *Swines Creſſes* burnt to Blackneſs, and as much Honey as was neceſſary. She boiled one of theſe Balls ſliced with cut green Camomile, or Camomile-flowers, ſweet Fennel, Parſley, and Burdock Leaves, of each one Ounce, in two Quarts of Water, half an Hour, then ſtrained it off, and ſweeten'd it with Honey. When theſe Herbs are not to be had green, ſhe takes the ſame Quantity of their Roots cut and ſliced.

Thoſe whoſe Stomachs can't bear this Decoction, may take one ſixth Part of the Ball formed into Pills, with every Doſe of the Powder.

The Pills are made by taking equal Quantities by Meaſure of *Snails* calcined as before, of *wild Carrot-ſeeds*, *Burdock-ſeeds*, *Aſhen-keys*, *Hips* and *Haws*, all burnt to Blackneſs, and reduced to a fine Powder. With a large Spoonful of this Powder, four Ounces of Soap, and as much Honey as is neceſſary, bring them to the Conſiſtance of Pills

Pills, of which ſixty are to be formed out of every Ounce of the Compoſition. In Fits of the Gravel five of theſe Pills are taken every Hour when awake, till the Complaints are removed.

During the Uſe of theſe Medicines, the Patient ought to abſtain from Salt Meats, red Wines and Milk, drink few Liquors, and uſe little Exerciſe.

Dr. *Hartley* (*Supplement to the View of the preſent Evidence*, &c.) leaving out the ſuperfluous Part of Mrs. *Stephen*'s Preſcription, reduces her Receipt to a more ſimple Form, to wit, to two and a half Ounces of *Soap*, and ſeven and a half Scruples of *Egg-ſhell Powder*, as the mean Doſe of the Medicines to be taken every Day.

Dr. *Hale's* (*Account of Experiments on Mrs. Stephen's Medicines*) after ſeveral Trials on the different Ingredients found that the diſſolving Power of them lay in the Lime, which Dr. *Rutly*, (*Account of new Experiments*) confirmed, and Dr. *Juryn* having taken *Soap-lees*, the Ingredients of which are *Potaſhes* and *Lime*, beginning with few Drops, and increaſing the Quantity till he took an Ounce, or an Ounce and a half every Day in a proper Vehicle, was cured of bloody Urine, Pain, &c. and paſſed ſeveral ſmall Stones, after which he had no Un-

eaſineſs. *See alſo our* Vol. V. Art. 69.

Dr. *Lobb* (*Treatiſe on Diſſolvents of the Stone*) propoſes to make the Cure of the Stone, by feeding only on thoſe Foods, which, he thinks, have moſt of the *Lithontriptic* Virtues, of which he has given us a Liſt.

LXXIX. *A Liſt of* Medical Books *publiſhed ſince the Beginning of the Year* 1735.

A Circular invitatory Letter to all Orders of learned Men deſiring Aſſiſtance in compiling a Hiſtory of the ſeveral Branches of Phyſick, and of the *Britiſh* Writers on any of them, by *Ed. Milward*, M. D. 8*vo*, *Lond.* 1740.

De claris Bononiæ Anatomicis Oratio Joſ. Ferdinandi Gulielmino, M D. & P. 4*to*, Bonon. 1737.

Jacobi Brucken *hiſtoria vitæ Adolphorum Occonum virorum clariſſimorum, ad illuſtrandam rem literariam & medicam ſæculi* XVI. *comparata*, 4*to*, *Lipſiæ*, 1735.

Alberti Schultens oratio in memoriam *Hermanni Boerhaave*, 4to Lugd. Bat. 1738.

Eloge hiſtorique de M. Mareſhall *premier Chirurgien du Roy, par* M. Morand, 4*to à* Paris, 1737. Got-

Gottofr. Chriſt. Bothii *de nominibus vocabuliſque, quibus medicos eorumque artem adpellârunt veteres Germani*, 8vo, Helmſtad. 1735.

Aſſemblée publique de la Societè royale des Sciences, tenue dans la grand ſalle de de l'hôtel de ville de Montpelier, 4to, Montpelier, 1736.

Recueil de Lettres, Memoires, & autres pieces pour ſervir à l'hiſtoire de l'Academie des Sciences & belles Letteres de la Ville de Beſiers, 4to, à Beſieres, 1736.

Exercitatio de principibus Diis artis medicæ tutelaribus apud veteres Græcos & Romanos. Autore Carolo Friderico Hundentmark, 4to, *Lipſiæ*, 1735.

Carol. Fred. Hundertmark *de incrementis artis medicæ per expoſitionem ægrotorum apud veteres in vias publicas & templa*, 4to, Lipſiæ, 1739.

Diſquiſitio medica & philologica de Variolis & Anthracibus, *ubi de utriuſque affectûs antiquitatibus, ſignis, differentiis medelis diſſerit*, Paul. Gottleib. Werlhoff, M. D. *accedit* Rudolph. Auguſt. Behrens, M. D. *Diſſertatio de affectionibus à comeſtis Mytulis*, 4to, Hanover. 1735.

Carbo peſtilens à carbunculis ſive variolis veterum diſtinctus delineante utrumque affectum, Joan. Goth. Hahn, M. D. *Accedunt*

dunt binæ, Dan. Wilhelm. Triller, *de eodem argumento epiſtolæ*, 4to, Wratiſlav. 1736.

De Schidia Cyrtonoſi, quæ Gliſſonio *Rachitis eſt, epiſtola* Sigiſmundi & J. Goth. Hahn, 4to Vratiſlav. 1735.

Wainwright on Non-naturals, 5th Edit. *Lond.* 1737.

A Treatiſe on the Non-naturals, to which is ſubjoined a ſhort Eſſay on the Chincough, by *J. Burton* M. D. 8vo, York, 1738.

Exercitatio Phyſico-medica de efficacia & uſu aëris mechanico in corpore humano, cui annectuntur obſervationes medico-practicæ, 8vo, Amſtelod. 1738.

Carl. Gottl. Rogiſs M. D. *Specimen de aqua ſalutari in forum medicum influxu & ferè optimo contra univerſos morbos præſidio*, 8vo Vratiſlav. 1737.

Vera vini & aquæ conſtitutio phyſica in Franconia *imprimis civitatis* Suinfurti, *cum variis & rarioribus obſervationibus medicis, autore* Jo. Frid. Rabel M. D. 4to, *Suinfurt.* 1737.

Traité des Eaux Minerales de Bourbonne les Bains, *par* M. Baudry *Medicin*, 8vo, à Paris 1736.

Traité des Eaux minerales de Vichi & *ſur la plupart des Eaux minerales de* France, *par* Jacques François Chomel. M. D. 12*mo*, *à* Clermont Ferrand. 1738.

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Breve Ragguaglio della natura e qualita dell' aqua nominata Volgo in Aſſiſi di Mejano *di* Nic. Ant. Cattani, M. D. 4to, Aſſiſii 1737.

Jo. Dan. Gohlii, *de fonte* Freyenwaldenſe *diſſertatio*, 4to Lipſ. 1735.

De aquis Brixianis *examen chymico-medicum, autore* Franc. Roncallo, 4to, Brixiæ, 1735

An Eſſay on *Witham* Spa, by *J. Tavernier*, M. D. 8*vo*, *London*, 1737.

An Enquiry into the Virtues of the medicinal Waters at *Briſtol*, by *P. Keir*, M. D. 8*vo*, *London* 1739.

A new Analyſis of the *Briſtol* Waters, by *John Shebbre* Chymiſt, 8*vo*, *Lond.* 1742.

An Inquiry into the Contents and medicinal Virtues of *Lincomb* Spa Water near *Bath*, by *W. Hillary*, M. D. 8*vo*, *Lond.* 1740.

The natural, experimental and medicinal Hiſtory of mineral Waters, by *Tho. Short*, M. D. 2 Vol. 4*to*, *London*, 1743.

An Eſſay on hot and cold Bathing, by *J. King*, 8*vo*, *Lond.* 1737.

De uſu arenæ externo in curandis quibuſdam morbis, autore A. D. 4to, Lipſiæ 1735.

Jo. Franc. le Fevre, M. D. *Tractatus de natura, uſu & abuſu Caffé, Thé, Cocolatæ & Tabaci*, 4to, Veſunt. 1737.

Quæſtio medica, Jac. Franc. Vandermonde, M. D. Præſide, *an infirmis à morbo viribus* Ginſeng? 4*to*, Paris 1736.

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An Epiſtle to Dr. *Mead* concerning the Seneca Rattle-ſnake Root, by *John Tennent*, 8vo, *Edinb.* 1738.

Exercitatio phyſico-medica de virtute Camphoræ refrigerante, autore Balth. Lud. Tralles M. D. 8*vo*, *Vratiſlav.* & *Lipſ.* 1735.

Lettera Scritta da. Jo. Jac. Zannichelli *intorno alle facolta dell' Ippocaſtano*, 4to, Venet. 1735.

Iſtoria della Piante che naſcono ne ledi intorno, a Venetia, opera poſthuma di J. J. Zannichelli, *Fol.* Venet. 1735.

A Treatiſe on the Force and Energy of crude Mercury, by *Thomas Harris* Surgeon, 8*vo*, *Lond.* 1735.

Carol. Henr. Rappolt, *de origine Succini in littore Sambienſi*, 4to, Regiomonti, 1737.

Deſcription des Plantes, &c. Tom. 2, 3, 4, 5, 6. *par* Mr. *Fabregou.* (*See our Vol.* IV. *p.* 502. and 512.)

Bibliotheca Botanica, à Jo. Franc. Segnierio, *ordine alphabetico digeſta*, 4to, Hagæ Comit. 1741.

Obſervationes ſur les Plantes & leur Analogie avec les Inſectes, 8vo, Strasbourg, 1741.

Hiſtoria Botanica practica, Joan. Baptiſt Morandi, *fol.* Mediolan. 1743.

Herman. Frid. Teichmeyeri, M. D. *Inſtitu-*

stitutiones Materiæ Medicæ, accedit Pauli Hermanni *lapis, M. M. Lydius*, 4to, Jenæ, 1737.

Tractatus de Materia Medica, sive de medicamentorum simplicium historia, virtute, delectu & usu, autore Stephano Geoffroi, M. D. 3 *Vol.* 8*vo*, Paris 1741.

S. Dale *Pharmacologia seu manuductio ad materiam medicam*, 4*to*, Lond. 1737.

Materia medica selectissima remedia tam simplicia quam composita, ordine alphabetico secundum eorum vires & doses cum formulis exhibens, autore Jo. Frid. Rubel. M. D. 4*to*, Lipsiæ & Baruthi, 1738.

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A Treatise on the Powers of Medicines, by *J. Martin*, 8*vo*, *Lond.* 1740.

De regimine magnorum auxiliorum in curationibus morborum, autore Homobono Pisone, M. D. 4*to*, Patav. 1735.

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Dispensatorium Medico-pharmaceuticum Pragense, *Fol.* Pragæ 1739.

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reviſa, *Fol.* Auguſt. Vindel. 1735.

The Hoſpital Diſpenſatory, by *H. Banyer*, M. L. 12*mo*, *Lond.* 1740.

The Family Diſpenſatory, by *T. Fuller*, M. D. 8*vo*, *Lond.* 1738.

The Ladies Diſpenſatory, 8*vo* *Lond.* 1739.

A complete extemporaneous Diſpenſatory, 8*vo*, *Lond.* 1740.

Le traité de la Matiere medicale du Mr. Boerhaave *traduit par* M. de la Mettrie, 12*mo*, à Paris, 1738.

Jo. Lindeſtolpe, M. D. *Liber de venenis*, 8*vo*, Francofurti 1739.

A true and candid Relation of the good and bad Effects of *Joſhua Ward*'s Pill and Drop, by *Joſ. Clutton*, 8*vo*, *Lond.* 1736.

Ward's Pill diſſected and examined by a Chymiſt of *London*, 8*vo*, *Lond.* 1736.

Philoſophical Experiments, by *Stephen Hales*, D. D. 8*vo*, *Lond.* 1739.

Eſſays medical and philoſophical, by *George Martin*, M. D. 8*vo*, *Lond.* 1740.

Miſcellaneous Experiments and Obſervations on various Subjects, by *B. Godfrey*, 8*vo*, *Lond.* 1737.

Jo. Frid Cartheuſeri, M. D. *Elementa Chemiæ medicæ dogmatico-experimentalis, una cum Synopſi materiæ medicæ ſelectioris*, 8*vo*, Halæ Magdeb. 1736.

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ra univerſali, vulgo Lapis Philoſophorum *dicta*, 4*to*, Norimb. 1736.

Nouveau cours de Chimie ſuivant les principes de Neuton *& de Stahl*, 12*mo*, *à* Paris 1736.

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Introduction à la Chimie accompagnée de deux traitez, l'un ſur le ſel des metaux, & l'autre ſur le ſoufre anodyn du vitriol, par M. Rothe *Medicin, avec une analyſe raiſonnée de l'Antimoine, & un traité ſur les tinctures Antimoniales, par Mr*, Mender, 12*mo*, à Paris 1741.

Jo. Andr. Crameri *elementa artis Docimaſticæ* 2 *Tom.* 8*vo* Lugd. Bat. 1739.

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De uſu artis anatomicæ oratio, A Cocchii Magellani, 4*to*, Florent. 1737.

Hieron. Leop. Baccheltoni *anatomia medicinæ theoreticæ & practicæ miniſtra*, 4*to*, Oeniponti 1740.

Jo. Erneſt. Hebenſtreit, M. D. *de vermibus anatomicorum adminiſtris commentatio in Act*, Lipſ. 1742.

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The Art of diſſecting human Bodies, tranſlated from *Lyſer's Culter anatomicus*, by *G. Thomſon*, M. D. 8*vo*, *Lond* 1740.

Bern. Sieg. Albini An. P. *Icones Oſſium fœtus humani cui accedit oſteogeniæ brevis hiſtoria*, 4*to*, Leidæ 1737.

The Anatomy of the human Bones and Nerves, *&c.* 3d Edition, by *Alexander Monro*, P. A. 8*vo*, *Edinburgh* 1741.

Methodus ſecandi & contemplandi corporis humani muſculos, autore Jo. Frid. Caſſebohm, *M. D.* 8*vo*, Halæ Magdeb. 1740.

Wyeri Gul. Muys *inveſtigatio fabricæ quæ in partibus muſculos componentibus extat*, 4*to*, Lugd. B. 1741.

Splanchnologie ſuivie de l'Angiologie & de la Neurologie, par M**. 12*mo*, *à* Paris 1739.

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Three Lectures on muſcular Motion, by *Alexander Stewart*, M. D. 4*to*, *London*, 1739.

Traité des Sens, par M. le Cat, 8*vo*, *à* Paris 1742.

Tractatus quintus anatomicus de Aure hu-

humana, *cui accedit sextus de aure monstri humani, cum tribus figurarum tabulis, autore* Jo. Fred. Cassebohmio, M. D. 4*to*, Halæ 1735.

Tractatus de Aure humana, *auctore* Ant. Maria Valsalva, *nec non ejusdem dissertationes Anatomicæ tres*, 4to, Venet. 1740.

Jo. Bapt. Morgagni, *epistolæ anatomicæ duodeviginti ad scripta pertinentes celeberrimi viri* Anton. Mariæ Valsalvæ, 2 Vol. 4*to*, *Venet.* 1740.

A Treatise of the Organ of Hearing, 8*vo*, *Lond.* 1737.

Le Mechanisme, ou le nouveau traité de l'Anatomie du Globe de l'oeil, avec l'usage de ses differences parties & de celles qui lui sont contigues, par Jean Taylor, M. D. 8*vo*, *à* Paris 1737.

Dissertatio de organo visorio nec non discursus de stibio, 4*to*, Romæ, 1738.

Jo. Jac. Huberi *de medulla spinali, speciatim de nervis ex ea provenientibus commentatio cum adjunctis iconibus*, 4*to*, Gotingæ 1741.

A Description of the human urinary Bladder, and Parts adjacent, by *J. Parsons*, M. D. 8*vo Lond.* 1742.

Dav. Corn. de Courcelles, M. D. *Icones musculorum plantæ pedis eorumque descriptio*, 4*to*, Lugd. B. 1739.

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Jo. Jac. Trew, M. D. *Diſſertatio de differentiis quibuſdam inter hominem natum & naſcendum intercedentibus*, 4to, Norimb. 1737.

Alberti Haller, M. D. & P. *deſcriptio fœtus bicipitis ad pectora connati, ubi in cauſas monſtrorum ex principiis anatomicis inquiritur*, 4to, Hanover. 1739.

A mechanical and critical Inquiry into the Nature of Hermaphrodites, by, *J. Parſons*, M. D. 8vo, *London* 1741.

L'Anatomie d'Heiſter, *avec des eſſaies de Phyſique ſur l'uſage des parties du Corps humain*, 2. Edit. 8vo, *à* Paris 1735.

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Drake's *Anthropologia nova*, 3d Edit. 3 Vol. 8vo, *Lond.* 1737.

Eſſais anatomiques, contenent l'hiſtoire exacte de toutes les parties qui compoſent le corps de l'homme, avec la manier de diſ-

diſſequer, par Mr. Lieutaud, M. D. 8*vo*, *à* Paris 1741.

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Anatomy epitomiſed, and illuſtrated in 17 large Copperplates, 8*vo*, *Lond.* 1737.

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H. Boerhaave, *prælectiones Academicæ in proprias inſtitutiones rei medicæ edidit, & notas addidit* Albertus Haller, *Tom.* 1, 2, 3, 4. 12*mo*. Amſtelod.

Dr. *Boerhaave*'s academical Lectures on the Theory of Phyſick, *Vol.* 1. 8*vo*. *Lond.* 1742.

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Diſſertation ſur la cauſe phyſique de la couleur de Negres, de la qualité de leur cheveux, par M. Barrere, M. D. 12*mo*, *à* Paris, 1741.

Tractatus phyſicus de effectibus muſices in corpus animatum, autore Jo. Wilh. Albrecht. M. P. 8*vo*, Lipſiæ 1735.

Quæſtio medica, Præſide Jo. Damiano Che-

Chevalier, M. D. an à diverſa cauſa moveantur cerebrum & dura meninx, *4to Paris* 1737.

An experimental Inquiry on ſome Parts of the animal Structure, by *Clifton Wintringham* jun. M. D. *8vo, Lond.* 1740.

An Enquiry into the Exility of the Veſſels of a human Body, by *C. Wintringham* jun. M. D. *8vo, Lond.* 1743.

A new Eſſay on the Nerves, and the Doctrine of the animal Spirits, *&c.* by *D. Bayne*, alias *Kinneir*, M. D. *8vo, Lond.* 1738.

Exercitationes medicæ quatuor; 1. *de motu vitali*, 2. *de ſomno & vigilia*, 3. *de fame*, 4. *de ſiti. Autore* Joanne de Gorter, *M. P. 4to* Amſtelod. 1737.

And. Paſtæ Bergomatis, *Epiſtolæ duæ*, 1. *De motu ſanguinis poſt mortem*. 2. *De cordis Polypo in dubium evocato*, *4to*, Bergom. 1737.

Exercitatio de admirando ſanguinis circuitu evulgata, à Chriſtiano Philippo Glaſs, *4to, Halæ* 1737.

Jo. Mariæ Lanciſii *tractatus de motu cordis & aneuriſmatibus*, *4to*, 1740.

Oeconomia regni animalis in tranſactiones diviſa quarum 1*ma agit de ſanguine ejus arteriis, venis, corde*. Lond. & Amſtelod. 1740. —— 2*da, De cerebri motu &*

de

de cortice & de anima. Autore Emanuele Swedenborg 1742.

Diſſertatio de natura & cauſis fluiditatis ſanguinis naturalis & deperditæ, ubi de diluentibus & emollientibus, de lactis natura, & uſibus in medicina, Autore H. Gouraigne, M. D. 8*vo*, Montiſpel. 1741.

Lectures on Reſpiration, by *Benjamin Hoadley*, M. D. 4*to*, *Lond.* 1740.

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Georgii Martinii, M. D. *De ſimilibus animalibus & de animalium calore, libri duo*, 8*vo*, Lond. 1740.

Perſpiratio dicta Hippocrati per univerſum corpus anatomicé illuſtrata, autore Abrahamo Kaav, M. D. 8*vo*, Leidæ, 1738.

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Eſſays on ſeveral Parts of the animal Oeconomy, by *J. Keil*, M. D. 4th Edit. 8*vo*, *Lond.* 1738.

An Attempt to explain the Oeconomy of the human Frame, 8*vo*, *Lond.* 1739.

Traité de la communication des maladies & des paſſions, avec un eſſai pour ſervir à l'hiſtoire naturelle de l'homme, par M*** 12*mo*, à la Haie 1736.

Principes de Chirurgie, par M** *Chirurgien*, 12*mo*, à Paris 1739.

L'art de conſerver les dents, par M. Gerauldy 12*mo*, à Paris 1737.

Diſſertation ſur un prejugé tres pernicieuſe concernant les maux des dents qui ſurviennent aux femmes groſſes, par M. Bunon, 12*mo*, à Paris 1741.

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ject, tranſlated by *W. Barroughby*, M. D. 8*vo*, *Lond.* 1738.

Juſti Godofr. Gunzii, *Anat. P. obſervationum Chirurgicarum de calculum curandi viis quas* Foubert, Garengeot, Perchet, Le Dran & Le Cat, Chirurgi Galli *reperierunt liber unus*, 8*vo*, Lipſ. 1740.

Parallel of the different Methods of extracting the Stone, tranſlated from *Le Dran*, 8*vo*, *Lond.* 1738.

Artis obſtetricandi compendium, autore Richardo Manningham, 8*vo*, *Lond.* 1739.

The Midwife's Companion, by *H. Brachen*, M. D. 8*vo*, *Lond.* 1737.

A Reply to Mr. *Douglas*'s ſhort Account of Midwifery, by *Edmund Chapman*, 8*vo*, *Lond.* 1737.

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Aphoriſms relating to the Pregnancy, Delivery and Diſeaſes of Women, from *Mauriceau*, by *T. Jones* Surgeon, 8*vo*, *Lond.* 1740

Obſervations in Surgery, 8*vo*, *London* 1739.

Practical Surgery illuſtrated and improved by *W. Becket* Surgeon, 8*vo*, *Lond.* 1739.

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W. Becket, 8*vo*, *London* 1740.

Saviard's chirurgical Obſervations, tranſlated, 8*vo*, *Lond.* 1739.

Reflexions ſur les Playes, par C. F. Faudacq Chirurgien, 12*mo*, *à Paris* 1735.

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Obſervations de Chirurgie ſur la nature & le traitment des playes, par M. Chirac. *& ſur la Suppuration des parties, par* Mr. Fizes, 12*mo*, *à Paris*, 1742.

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Selecta Medica Francofurtenſia, *Tom.* 1, 2. 8*vo*, Francofurt.

Medicorum Sileſiacorum ſatyræ medicæ ſpecimen, 2——— 6. 8*vo*, Wratiſlaviæ & Lipſiæ.

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Eſſais

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Actorum Medicorum Edinburgenſium *ſpecimina duo*, 1. *de medicamento alterante ex Mercurio.* 2. *De aurigine. Ex Anglico Sermone latine reddidit* Paul. Gotlieb Werlhof, M. D. 4*to*, Hanover. 1735.

LXXX. *Books propoſed, and other medical News.*

DR. *Edward Milward*'s invitatory Letter, (mentioned *p.* 1002.) informs us of his Purpoſe to publiſh an Account of all the *Britiſh* Improvers and Writers in the different Parts of Medicine.

The Colleges of Phyſicians at *London*, and at *Edinburgh*, are each preparing new Editions of their Diſpenſatories.

Dr. *Albinus*'s Edition of *Euſtachii tabulæ anatomicæ*, with his Explication of them, is every Day expected to be publiſhed.

The late Dr. *George Martin*, ſeveral of

whoſe Eſſays are inſerted into our Volumes, had finiſhed his hiſtorical and critical Commentary on *Euſtachii tabulæ anatomicæ*, before he ſet out on his Voyage to *America*; They were approved by ſeveral good Judges in thoſe Matters, and are now put into the Hands of Mr. *Monro* Profeſſor of Anatomy in *Edinburgh*, who has undertaken the Trouble of the Publication of this Work.

We have ſeen ſeveral elegant Figures of human Sceletons and muſcular Subjects with their Explications, publiſhed by Dr. *Albinus* Profeſſor of Anatomy at *Leyden*, and hope he will continue them till we have a compleat Syſtem from him.

A Bookſeller of this Place, (*Edinburgh*) aſſiſted by ſome Lovers of Anatomy, has undertaken to give us the Figures of all the Parts of the human Body, with their Explications. He has publiſhed what he calls the *Oſteography* or Repreſentation of the Bones, contained in four Plates in *Folio*, and we have ſeen three of the Tables of the *Myography*. The Tables are neither ſo large nor ſo elegant as *Albinus*'s, having the Letters of Reference marked on the ſame Plate with the Pictures; whereas in *Albinus*'s, the Pictures have no Letters with them, the Letters being cut on Plates where the Out-

lines

lines only are repreſented. On the other Hand, the *Edinburgh* Plates contain each as much Anatomy as three of Dr. *Albinus*, and are ſold each at one 10th of the Price of his; ſo that if both are continued in the ſame Manner, till a complete Syſtem is finiſhed, the *Edinburgh* ones will be conſiderably leſs than one thirtieth of the Price of the *Leyden* ones. The *Leyden* Tables are all Originals from the Life; the *Edinburgh* are moſtly copied from thoſe of *Albinus*, *Cheſelden*, *Cowper*, *Ruyſch*, *Morgagni*, &c. Parts being only delineated from the Life, when there are no good Pictures to copy from.

The Marks of Reference are much more numerous in the *Leyden* Figures, and conſequently the Explication is much more minute than in the *Edinburgh* ones.

Dr. *Bianchi* Profeſſor of Anatomy at *Turin*, propoſes ſoon to publiſh *Anatomiæ ſtatus priſcis ſæculis ad medicam praxin qui fuerit, qui vero ſuperiori ſæculo, & qui in præſenti ſæculo exiſtat, cum figuris. Uteri humani gravidi anatome & hiſtoria, Autore* Wilhelmo Noortwyk, M. D. *cum figuris*, 4*to*, is daily expected from the Preſs at *Leyden*.

Dr. *Haller* promiſes the fifth Volume of his Commentary on *Boerhaavii Inſtitutiones*

tiones medicæ, about *January* 1744, and deſires the Opinion of the learned whether he ſhould ſtop when the Phyſiology is ended, or if he ſhould give another Volume with Dr. *Boerhaave*'s own Commentary on what remains of the Inſtitutions, Dr *Haller* being reſolved to add no Notes to this Part.

The firſt Volume of *Van Sweten*'s Commentary on Dr. *Boerhaave*'s *Aphoriſms*, is going to be reprinted, the firſt Edition being ſold off; and the ſecond Volume of his Commentary is in the Preſs at *Leyden*.

Serjeant Bernard's antient and modern Hiſtory of Surgery is expected.

The Academy of Surgery at *Paris* is to publiſh in Volumes apart from their *Memoires*, the Caſes and Hiſtories communicated to the Society.

Dr. *Heiſter* promiſes (*Inſtit. Chirurg.* p. 434.) to publiſh his practical Obſervations.

We are informed that Dr. *Robert Dalrymple*, Phyſician to the *American* Expedition is ſoon to publiſh an Account of the *Yellow Fever*, commonly called the *bilous Fever*, which is generally ſo fatal in the *Weſt Indies* to all who come from *Europe*, and we are made to hope that he will diſcover to us a more effectual and ſucceſsful Method of treating that Fever than has hitherto been practiſed.

Dr.

Dr. *Loew* Phyſician at *Vienna* is to cauſe his Father's *Obſervationes Medicinales Hungaricæ* to be printed.

Propoſals were diſperſed ſometime ago for printing Dr. *Strother*'s poſthumous Works, being a complete Syſtem of Phyſick in Theory and Practice, in 2 *Vol.* 4*to.*

Dr. *Stephen Macky* is about to publiſh a new Edition of *Hippocrates*'s Works at *Vienna.*

A ſecond Volume of the *Commentar. Acad. Bononienſis* is ſaid to be preparing for the Preſs by the Secretary *Zanotti.*

It is expected that the Royal Academy of *Montpelier* will publiſh a Volume of their Memoires.

The Academy of Surgery at *Paris* propoſed the following Queſtions, for the Subjects of Diſſertations to be given in by the Competitors for their yearly Prizes.

For the Years 1735, 1737, 1739, to determine the diſtinguiſhing Character of Gun-ſhot Wounds, and the Manner of treating them.

For 1736, 1738, Whether ought cancrous Breaſts to be extirpated.

For 1740, 41, 42, To determine the different kinds of Repercuſſives, their manner of acting, and the Uſe that ought to be made of them in the different chirurgical Diſeaſes.

The

The Academy of Literature, Sciences and Arts at *Bourdeaux* gave their Prize of 1737 to our Countryman Dr. *Alexander Stewart* as having, in their Opinion, best explained the Cause of *muscular Motion*; and they gave the Prize of 1739 to Father *Bertrier*, as having wrote the best Dissertation on this Question, *Whether Air enters the Blood in Respiration?*

An Academy for the Improvement of Arts and Sciences is lately formed at *Beziers*.

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